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PROSTATITIS*†

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BALTIMORE, MD.

Much has been written concerning prostatitis, both acute and chronic, about its etiology, and the many and varied types of treatment. The frequency of this condition is such that it is of general interest to all medical men, particularly internists, orthopedic surgeons, and urologists. Pelouze has stated that 35 per cent of all men over thirty-five years of age suffer from chronic prostatitis. Wiseman, in 200 unselected men who consulted him as an internist discovered 108 instances of chronic prostatitis. Von Lackum found in 100 cases of arthritis that a cure was secured in 16.7 per cent after treatment of the prostate. The present article advances nothing original in the manner of treatment, but is a review of the literature and a discussion of the results and type of treatment used in the Genito-Urinary Clinic at the University Hospital.

Before going into the discussion of prostatitis it might be well to review briefly the embryology, anatomy, and what is known of the physiology of the prostate gland. The prostate gland is situated at the vesical neck; it surrounds the urethra and is pierced by the ejaculatory ducts. The gland develops by tubular epithelial outgrowths from the urethra in five independent groups, which begin to develop about the twelfth week of fetal life. The middle lobe develops from the floor of the urethra between the bladder and the opening of the ejaculatory ducts; from an embryologic viewpoint this lobe is independent of the two lateral ones; from a practical and an adult anatomic viewpoint it is a glandular commissure between the two lateral lobes. These arise from the lateral walls of the urethra in the prostatic

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furrows. They are separated from each other from above downwards by the anterior lobe and commissure, urethra, ejaculatory ducts, and the middle lobe. Posteriorly a fibrous capsule separates these lobes from the posterior one. The posterior lobe arises from the floor of the urethra below the opening of the ejaculatory ducts and goes back behind these structures, but is separated from the rest of the gland by a fibrous capsule. This part of the gland may be palpated rectally. Body and Geraghty reported that hypertrophy rarely or never occurs in the posterior lobe and primary carcinoma of the prostate rarely or never begins anywhere else. The anterior lobe is fairly large in early embryonic life but rapidly diminishes in size and importance, and even before birth is insignificant. Occasionally an enlarged anterior lobe is found at autopsy.

The entire structure is composed of glandular substance, muscular tissue, and a small amount of connective tissue. The muscular and fibrous tissues constitute the stroma of the prostate. There is a dense muscular sheath of circular fibers surrounding the gland and immediately beneath the fibrous capsule. A second layer surrounds the urethra blending above with the internal muscular coat of the bladder and below with the fibers of the sphincter urethrae membranaceae. These two layers are connected by decussating fibers within whose meshes are found the tubules or glandular part of the organ and the blood vessels. The muscle is of the smooth or nonstriated type. The glands are the tubular acinus type and consist of three groups arranged concentrically about the urethra. One is an inner mucosal or periurethral group whose ducts empty radially into the urethra from the complete circumference. The other two groups, the mucosal and the main groups, encircle the periurethral group and have a number of alveoli emptying into the common ducts. These ducts converge and open into the prostatic sulcus. There are about sixty of these openings into the sulci. The distal group of these ducts have their openings on either side of the verumontanum. The tubules are lined with a single and occasionally a double layer of cuboidal epithelium.

The blood supply of the prostate come from the internal pudendal, inferior vesical, and middle hemorrhoidal arteries. The veins form a plexus which lies outside the fibrous capsule but within the fascial sheath derived from the endopelvic fascia. They receive blood from the dorsal vein of the penis and empty into the hypogastric veins.

The nerves are of both motor, or secretory, and sensory types. The sympathetic nerves come from the hypogastric plexus through the presacral nerve; the parasympathetic fibers come from the sacral plexus, these latter originating in the third and fourth sacral nerves. The presacral nerve bifurcates in front of the sacrum and produces two hypogastric nerves which pass down to form the pelvic plexus lying on either side of the rectum.

These nerves also contain the parasympathetic fibers mentioned. Both types of nerves pass to the prostate gland and innervate the smooth muscle fibers which are a continuation of the external, longitudinal, and the internal circular layers of the bladder. The pudendal nerve sends sensory fibers to the posterior urethra and probably to the prostate gland. Other fibers from this prostatic plexus join branches from the pudendal nerve passing forward beneath the pubic arch. From the foregoing description of the nerve distribution it can readily be appreciated that stimuli arising in the prostate can be transmitted and interpreted as pain in the back, perineum, and thighs. Head, about fifty years ago, explained the production of surface pain of visceral origin as a "transmutation of afferent sympathetic nerve impulses," in other words, an overflow into areas which correspond segmentally to the spinal sensory nerves.

The lymphatic vessels arise in a network about the acini and drain into a periprostatic plexus. This plexus has four afferent channels: one to the external iliac glands; a second to the internal iliac group; the third and fourth channels drain into the internal and common iliac groups on the anterior surface of the sacrum.

The true physiology of the prostate gland is poorly understood. The only proved function is the elaboration of an external secretion which acts as a medium for the sperm, dilutes the excretion from the seminal vesicles, adds bulk to the ejaculation, and aids in the mobility of the sperm. Some have thought that it stimulates the spermatozoa. The secretion is usually alkaline in the uninfected gland and is a thin milky fluid in contrast to the clear, gelatinous secretion of the seminal vesicles. The normal secretion has an alkaline reaction and contains albumin but no mucin, and has a characteristic musty odor. Microscopically it contains a few epithelial cells, four to six pus cells, mainly leukocytes, many small refractile bodies (about one-third to one-half the diameter of a pus cell) known as lecithin bodies, occasionally sperm cells, corpora amylacea, and red cells. Serrellach believed from his experiments on dogs that an internal secretion is produced, which plays a part in the sexual act. This function has never been proved.

PATHOLOGY

The pathologic change in chronic prostatitis is that of chronic passive congestion. Rectally the gland feels somewhat enlarged, boggy, and with increased tenderness. The acutely inflamed gland is enlarged greatly, feels tense, and is exquisitely tender. Microscopically the chronic prostate gland will give the usual aspects of inflammation, that is, hyperemia, edema, and cellular infiltration with fibrosis and parenchymatous destruction. There is usually considerable edema, and lymphocytic and polymorphonuclear infiltration about the minor ducts. In many cases there will be an

active migration of cells into the epithelium. Generally there is no metaplasia of the epithelium. The glandular portions show the lumen filled with acidophilic debris and leukocytes. The surrounding stroma is edematous and infiltrated with the same cells. The epithelial cells, which are low columnar or cuboidal, have a dense acidophilic cytoplasm and show no evidence of secretion. In acute prostatitis this aspect is intensified greatly and found throughout the whole gland instead of being in patches, and there may be small abscess areas.

A bacteriologic study of the gland reveals surprisingly few cultures of the gonococcus. Cummings and Chittenden found that staphylococcus alba and the colon typhoid group of bacilli accounted for 80 per cent of the cultures they obtained from the prostatic fluid, whereas Ritter and Lippow found only 4 per cent in the colon group. The staphylococcus alba, streptococcus alpha, and a gram-positive diplococcus each accounted for about 20 per cent. What has been found frequently is a diplococcus, which has culture characteristics differing from the gonococcus and is thought by Heckal and Jensen to be an altered avirulent gonococcus. An aid to this assumption is the fact that the wives of these men are frequently free from gonorrhea. Many and varied organisms have been found; however, a large amount of pus may be expressed from an infected gland and the cultures still would be negative. There is no one organism that can be called the specific bacterium.

ACUTE PROSTATITIS

The symptoms, diagnosis and treatment are simple and satisfactory when compared with chronic prostatitis.

ETIOLOGY

Most of the cases of acute prostatitis develop as a complication of gonorrhea, and frequently as a result of harsh, inadequate or improper treatment of an ordinary posterior urethritis. Occasionally one will see a case of acute prostatitis which has followed an infection in some other part of the body as, for instance, grippe or tonsilitis. A chronic prostatitis, when the gland is considerably enlarged and boggy, may be converted to an acute prostatitis, by the passage of sounds or a cystoscope.

SYMPTOMATOLOGY AND DIAGNOSIS

Pain in the perineum and in the region of the rectum is the presenting symptom. There may be pain descending on the inner side of the thighs. Many complain of continuous discomfort when walking, standing or sitting, and of being able to obtain relief only when lying down. Pyuria frequency and diminution of the stream are frequently seen as a result of the enlarged

prostate's encroachment on the vesical neck and irritation of the trigone, and occasionally acute retention of urine. Defecation is painful. These local symptoms are usually accompanied by constitutional reactions of fever, headache, and general malaise. The acute prostatitis may also be complicated with an acute epididymitis or a vasitis and seminal vesiculitis. A rectal examination will reveal a large gland, about 8 cm. in diameter, that is tense and tender.

TREATMENT

The treatment that has been found most generally satisfactory is the use of heat by enema or sitz baths, or diathermy applied with a rectal electrode. This last type of treatment usually gives immediate relief. After one twenty or thirty minute treatment the most aggravating symptoms disappear. In the hyperacute case a treatment may be given daily for two or three days and thereafter every second or third day for about six treatments. Sulfanilamide in daily doses of 60 or 80 grains has been used; but there is little difference in the rate of recovery of those who receive it and those who do not. All local treatment or massage is, of course, contraindicated. The above is the routine followed in the University Hospital Clinic; it has given satisfactory results.

In the past year thirty-seven patients have been treated by these methods at this Clinic. Nine received diathermy treatment and had symptomatic relief within twenty-four hours after the first treatment. Four more did not obtain relief until after two treatments. In none of these cases was the size of the gland appreciably affected when the symptoms were relieved. Twenty-four patients whose symptoms had not been so severe were given enema and sitz bath treatments only. Their relief from symptoms was not as dramatic as in the previous group, being much more gradual. There was little difference in the time required for the recession in the size of the gland to take place, all requiring about ten days before any decided reduction was noticeable. Since the advent of sulfanilamide in the treatment for gonorrhea, there has been a very marked reduction in the amount of acute prostatitis that is seen. The author does not use the Elliott applicator; but from the reports of other clinics, results have not been markedly different from those of the clinic at the University of Maryland.

CHRONIC PROSTATITIS

ETIOLOGY

The etiology of chronic prostatitis was at one time thought to be almost entirely caused by the gonococcus. In recent years a more careful and thorough investigation has disclosed the fact that fully one third of the cases

have no relation to gonorrhea; and in many of the cases that give a history of previous infection, no evidence of the gonococcus can be found. Kretschmer, Ritter, Lippow, Cummings and Chittenden have all shown this by cultures of prostatic fluid. All studies of chronic prostatitis will show that a large number of the individuals have had gonorrhea at some time in the past. It is difficult to evaluate the rôle played by these past infections. Some urologists, such as Pelouze and Horowitz, estimate that between 50 per cent and 60 per cent of the male population have or have had gonorrhea in their lives. Undoubtedly many cases of chronic prostatitis are either directly caused by foci of infection elsewhere in the body or at least aggravated by their presence. The most common foci are the teeth or tonsils. The sinuses apparently do not play such an important rôle according to Haven. Worry, nervous strain and overwork, although not an etiologic factor in this disease, will aggravate the symptoms of a chronic prostatitis.

SYMPTOMATOLOGY

The symptomatology of this condition is as varied and diverse as the treatment, and much more obscure and unrelated. The universal symptom of prostatitis is "low backache," the "millionaire's lumbago" and the working man's sacroiliac. They are like "the colonel's lady and Judy O'Grady"—sisters under the skin.

A sacroiliac sprain comes suddenly and very acutely, and the acute symptoms subside in four or five days. A myofascitis has a sudden onset and is well in a few days. The backache from prostatitis is an insidious thing. Usually the onset is gradual with constant dull ache, a heavy feeling in the back. There are acute flare-ups followed by remissions to a constant level of discomfort. This is usually lessened upon lying down. Other common sites of prostatic pains are the perineum and the inner side of the thighs. This pain is fairly constant and is not of an acute or disabling nature, but is a persistent ache. Many men with a prostatitis complain primarily of some form of gastrointestinal disturbance, and are seen first by the gastroenterologist. This type of pain is located in the lower abdomen over the bladder and radiates laterally, and is occasionally felt more severely in the genitalia.

All of these symptoms are caused by a reflex mechanism. It must be remembered that the sensory nerves of the prostate are through the presacral nerve, which is a sympathetic nerve, the fibers of which pass to the thoraco-lumbar sympathetic trunk, which also sends fibers to the various other organs by way of the sympathetic plexi found around the abdominal aorta and accompanying its various branches. These afferent sympathetic nerves form synapses in the spinal ganglion or in the posterior horn cells of the spinal cord, the impulse of these being interpreted in relation to the func-

tion of the organ rather than pain. The exact level of entrance into the cord is unknown.

Other symptoms that are the result of chronic prostatitis are those related to the loss of sexual power. A certain small percentage present this as the outstanding symptom. They will complain of loss of libido, premature ejaculation and inability to complete the sexual act. It is our experience that these symptoms are seen more frequently in the Negro than in the Caucasian. This may result from the fact that the Negro's sexual power is more markedly important to him than it is to the white man.

Osler's statement that a complete knowledge of syphilis is necessary to know medicine might be paraphrased in this way; to understand internal medicine one must know the ramifications of chronic prostatitis.

DIAGNOSIS

There is one and only one way in which the diagnosis of chronic prostatitis can be made. The subjective symptoms which have been shown are so wide and varying that they will only point the way in which the investigation should be directed. A rectal examination is not conclusive, as some perfectly normal prostates will seem large and have a boggy feeling, while many prostates from which large amounts of pus can be expressed will be small and firm. After the gland is massaged the secretion should be examined under the microscope. The results of one examination are not conclusive. The examination should be repeated within four or five days. The first examination may reveal large numbers of pus cells clumped together, while the second may reveal a perfectly normal number of pus cells and many lecithin bodies. This is because some of the ducts may have been plugged up and the first massage probably forced out this plug and given a false impression of the secretion. Secretions which on several examinations show numerous fields with ten or more pus cells, many of these clumped, and a meager number of lecithin bodies present, indicate chronic prostatitis.

TREATMENT

Like all diseases in which no specific type of therapy has been discovered a large assortment of types of treatments have been tried on chronic prostatitis. Some of these are absurd, others are radical, but the majority are based on the principle of massage and heat which is consistent with the general treatment of localized infections. Here massage produces drainage. One German author advocated packing the rectum with warm mud; the little benefit his patients derived resulted from the heat in the mud. Foster advocated suprapubic cystotomy for those cases which do not respond to a long period of massage. He advocated this particularly in those semi-soft, large, pulpy feeling glands which gave pain and tended to produce some

obstruction, and were frequently complicated with mental symptoms such as depression and melancholia. He passed a catheter through the urethra and connected the suprapubic tube to a reservoir which contained warm boric acid solution, and irrigated the bladder at intervals. His results were satisfactory in the cases he selected.

In 1917 Townsend and Cano were the first to inject the prostate gland directly. They injected the gland with various antiseptic solutions through the perineum. This met with very little enthusiasm and was seldom used. Grant in 1928 revived the method, using a 1 per cent mercurochrome solution. He and O'Connor believed that possibly it is the reaction produced in the gland by the puncture and the introduction of any foreign substance which produces scar tissue and subsequent contraction of the gland that is helpful as much as the antiseptic action of the medium injected. Their results have been favorable. Grant did not advocate the use of this type of therapy in all cases, but that it be reserved only for the obstinate ones which do not respond to massage.

One of the common methods of applying heat to the prostate gland is by the Elliott apparatus which consists of a rubber bag placed in the rectum through which is pumped water under $2\frac{1}{2}$ to 3 pounds of pressure. The temperature at the start of the treatment is 124 F. This is applied for 45 minutes the first day and an hour daily thereafter, the temperature being raised 1 degree of temperature each day until 130 F is reached, where it is maintained. Ten to 14 treatments are usually necessary. This type of treatment is frequently used in acute prostatitis. Then the treatment is given twice a day with moderately satisfactory results. Diathermy has been used, but with mediocre results.

The old stand-by, the treatment universally employed and the one most generally satisfactory, is that of massage. This should be done at first not more often than twice a week and then very gently. After 2 or 3 weeks the treatment should be given only once a week. The treatment is carried on for 10 or 12 weeks when a rest period of a month is given and the secretion checked at this time for the number of pus cells. If an improvement is noted the rest period is continued; otherwise more weekly massages are given.

Vincent J. O'Connor has shown in the prostates of dogs which have been massaged just a few hours previous to autopsy that there was a desquamation of some of the epithelial cells lying in the alveoli and a moderate amount of round cell infiltration in the supporting tissue. He also showed in dogs which had been massaged daily for a number of days that there was a rupture of the alveolar walls and a tendency for cyst formation. So it would seem that too frequent massage is more harmful than beneficial. After the individual has been receiving massages weekly for about six weeks, it is wise to give him a rest period for a month or six weeks. Then the secretion

should be examined and if there is improvement, the rest period should be continued for another two or three weeks. Massage therapy may be supplemented with bladder injections of boric acid, potassium permanganate or neo-silvol. The usual procedure is to fill the bladder before massage and then empty it. Argyrol 10 per cent or 20 per cent may be injected into the bladder and into the prostatic urethra with a Keyes-Ulzeman syringe after massaging the gland. Sulfanilamide had been employed and found of very little value, as have all other medications administered orally and intravenously. The writer, while in the army, had the opportunity to try twenty-four courses of penicillin (160,000 units) on a few cases. This treatment gave temporary relief up to two months in some instances. Penicillin therapy deserves further investigations.

One factor that must be taken into consideration in those cases which do not respond well to massage is the general condition of the patients. They are frequently undernourished men in their late fifties and addicted to alcohol. Their general resistance is poor; or they are younger men whose sex hygiene is frequently not of the highest order. All cases which do not respond to massage after a reasonable length of time should have their upper urinary tract investigated for the possibility of a pyelitis, a pyelonephritis or even a cystitis, which may be constant sources of reinfection to the prostate.

CONCLUSION

At the University Clinic in the past year and a half there have been 117 cases of chronic prostatitis, all of which were improved by massage. The average length of treatment for those who were considered cured was three months. They were symptom-free. Their secretion obtained on massage showed four to eight pus cells per high powered field on examinations repeated at monthly intervals for three additional months. This number totaled 71. There were 32 other cases that received from four to eight massages only. They came at very irregular intervals, feeling improved after one or two massages and staying away for several months, when their symptoms would recur. Then they came back and received several more massages, and then disappeared for another period of weeks. The remaining 14 have been receiving massage at fairly regular intervals over a period from six to ten months. While these patients feel better they can not be classed as cured, as their secretion still contained a large amount of pus. If they missed their weekly massage for three or four weeks, their symptoms, chiefly backache, recurred. These are mostly elderly men who have some hypertrophy in addition to their prostatitis.

Massage, diathermy, sulfanilamide, injection of drugs and whole blood intermuscularly have been tried, and the conclusion has been reached that massage with the irrigation or urethral injection is the most satisfactory

type of treatment. The suprapubic operation is too radical for the cases seen at the University of Maryland Clinic. In the face of some of the bad results following direct injection into the gland, further investigation must be done before this method is more universally adopted even for refractive cases. None of these cases failed to clear up with massage.

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"ETHYL-NOR-EPINEPHRINE," A NEW DRUG FOR SYMPTOMATIC RELIEF OF BRONCHIAL ASTHMA*†

PRELIMINARY REPORT

HOWARD M. BUBERT, M.D. AND JOHN P. DOENGES, M.D.

In 1934 Tainter and his associates (9) reported their studies with certain sympathomimetic amines which had been chosen from about one hundred drugs because of their bronchodilator qualities. The drugs were tested in the following manner. Isolated guinea pig lungs were perfused by introducing fluid into the trachea and allowing it to escape from the alveoli through scratches on the surface of the lungs. After the rate of flow had become constant pilocarpine, histamine and barium chloride were administered as bronchoconstrictor agents and the effects upon the flow of fluid was noted. The most active bronchodilators were found to contain the catechol nucleus. Using epinephrine as the standard it was determined that "E.N.E."** is a moderately strong bronchodilator.

Later, Pedden, Tainter and Cameron (7), tested the substance in intact dogs which had received arecoline hydrobromide, a para-sympathetic stimulant, as the bronchospastic agent. About the same results were obtained as in the isolated guinea pig lung, so that the two methods were interchangeable to all intents and purposes. When administered to intact dogs, "E.N.E." was an efficient bronchodilator.

In a later study (1), they produced bronchoconstriction with a musclopilotropic agent, histamine and estimated the effect by measuring the flow of air in and out of a tracheal cannula. The blood pressure was also recorded from the left carotid artery with a mercury manometer in the usual manner. These tests indicated that "E.N.E.", although a good bronchodilator, had no vasoconstrictor action and, furthermore, augmented the heart action. There was no consistent relationship between the bronchodilator and pressor efficiencies of the compound studied.

Using the cat as the test animal in a series of elaborate studies (4), it was determined that the fall of blood pressure caused by "E.N.E." was actually the result of a combination of vasodilator and vasoconstrictor actions, with the former predominating. There was also an increase in cardiac output. Subsequent research explained more clearly (2), the effect of "E.N.E." on

* From the Allergy Clinic, Department of Medicine, School of Medicine, University of Maryland, Baltimore, Maryland.

† Received for publication June 4, 1946.

** For convenience, the abbreviation "E.N.E." for Ethyl-Nor-Epinephrine will be used hereafter. This drug was supplied by the Winthrop Chemical Company.

the vasomotor mechanism; and this depressant action upon the blood pressure was further confirmed in another article (3).

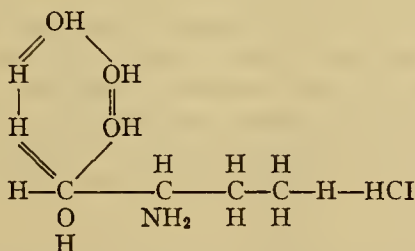
In 1940, using the rat as the test animal, the degree of central stimulation resulting from the introduction of sympathomimetic amines was shown clearly (8). As is well known, epinephrine is quite active in this regard. "E.N.E." produced very slight stimulation. In view of the fact that this action of epinephrine definitely decreases its field of clinical usefulness, particularly in susceptible individuals, the lack of it after the administration of "E.N.E." was most important. This advantage, when coupled with the previously mentioned freedom from pressor action, assumes added significance.

Because of the aforementioned characteristics of "E.N.E.", namely, bronchodilator activity; lack of pressor effect; and low or completely absent stimulation of the central nervous system, the drug appeared to the workers in question to be a possible valuable agent in the control of bronchial asthma.

For the last eighteen months the authors have used "E.N.E." in bronchial asthma and have found it to be of the greatest value. Certain queries suggested themselves as being of paramount importance and as demanding initial consideration. These are; (1) is the drug clinically effective? (2) can it be used safely in the presence of hypertension where epinephrine is contraindicated? (3) can it be given intravenously with relative safety? and, (4) can it be used without producing nervousness from central nervous system stimulation, which is so frequently an unpleasant side effect of epinephrine?

CHEMICAL AND PHYSICAL PROPERTIES

According to the manufacturers (10) "E.N.E." is racemic 1-(3,4-dihydroxyphenyl)-2-amino-1-butanol hydrochloride. It has the following structural formula:



The molecular weight is 233.693. It is a colorless, odorless, bitter, crystalline powder, readily soluble in water and alcohol, but insoluble in ether and benzene. "E.N.E." melts with decomposition at 198–200C.

CLINICAL EFFECTIVENESS

Intramuscular administration. Forty cases of bronchial asthma were picked at random for study. The symptoms varied in severity from 2 to 4, using 1 to 4 as the complete range of variation; one case, graded as severity 1, represented the sole exception. The attacks in which "E.N.E." was employed in turn, varied from 2 to 4 with a rare attack rated as 1. The dosage of "E.N.E." ranged from 1 to 4 mg. with an average dose of 2.4 mg. Sixty-six attacks were treated intramuscularly by the clinic staff. Results were likewise evaluated numerically, using a range of 1 to 4, with 1 representing about 25 per cent relief and 4 representing subjectively and objectively 100 per cent relief. Four plus relief is difficult to obtain with any drug and, therefore, three plus relief represents for all practical purposes, completely adequate clinical results. In sixty-six attacks treated intramuscularly by the clinic staff the average relief was roughly 65 per cent.

Of the 66 attacks, 100 per cent relief was obtained in 22 attacks (33 per cent); in 18 attacks (27 per cent) there was 75 per cent relief; in 12 attacks (20 per cent) there was 50 per cent relief; in 7 attacks (10 per cent) there was 25 per cent relief; no relief in 7 attacks (10 per cent).

As experience with the drug increased, it was given more freely and satisfactory results were obtained in a considerably greater per cent of all attacks in which it was used.

Because it was desired to record, insofar as this was possible, the results with complete objectivity, certain patients were asked to exhale to their maximum into a vital capacity machine during an episode. "E.N.E." was then given and about twenty minutes later the procedure was repeated. In twenty-six such observations the respiratory capacity increased an average of 92.7 per cent, varying from 0 to 437 per cent increase. The maximum change was an increase from 400 cc. to 2150 cc.

Blood pressure readings were taken prior to the injection of "E.N.E." in twenty-one instances and repeated twenty minutes after its administration. It was found that a 7 millimeter average decrease in the systolic pressure and, an 8 millimeter decrease in the diastolic pressure had occurred. None of these reductions were remarkable except in one hypertensive patient in whom the systolic pressure dropped from 188 to 162 and the diastolic pressure from 124 to 108. Because the effect of the drug on the blood pressure when administered intramuscularly seemed insignificant, this procedure was discontinued as it did not seem to warrant the loss of time involved.

Intravenous administration. The authors are now routinely using "E.N.E." intravenously because it has been proved to be safe and to give excellent clinical results. In the majority of instances, pressure of work in the accident room makes it impossible to keep adequate notes. However, in six-

teen cases in which intravenous injections were done under conditions favorable to the recording of results, these observations are presented.

The sixteen patients under consideration varied in age from 7 to 69 years with an average age of 43+ years. As might be expected, intravenous administration was utilized only in those attacks that were very severe, many of them representing true status asthmaticus. Therefore, one would anticipate a rather advanced average age because most of them were asthmatics of many years duration and of extreme severity.

As evidence of the severity of the attacks treated intravenously, the average rating of the patient's condition was 3.5 and of the attacks 3.2. When one considers that a rating of 4 represents extreme status asthmaticus, in so far as an attack is concerned, and, prolonged severe intractable asthma when the condition itself is under consideration, it can be seen that these cases were very severe.

The average intravenous dose was 2.4 mg. varying from 1-10 mg. The majority of the doses were 5 mg. or less. In 6 cases the blood pressure was taken immediately before and, again, immediately after the administration of the drug. The average systolic pressure before injection was 126 mm. of mercury, and immediately after 110 mm., representing an average decrease of 16 mm. of mercury. The diastolic pressure before administration of the drug averaged 79 and, immediately after, 71 mm., showing an average decrease of 8 mm. of mercury. From fifteen to thirty minutes after the drug was administered intravenously, the average systolic pressure was 109, representing a reduction of 17 mm. of mercury. The diastolic pressure before administration was 79 and, fifteen to thirty minutes after, 76, representing an average decrease of 3 mm. of mercury.

The maximum change was in patient E. D., in whom the blood pressure dropped from 126/80, prior to the administration to 80/58 immediately after. This patient fainted but, subsequent questioning revealed that she had been without food for a very long period previously. Within fifteen to thirty minutes her blood pressure had returned to 100/72 and the asthma was very much better. Actually, she only received about 2 cc. of a normal saline solution which contained 5 mg. of "E.N.E." per hundred cc. It seems unlikely that this minute amount of drug (0.1 mg.) could have caused the fainting and the drop in blood pressure; nevertheless the blood pressure readings are included in our totals.

In addition to the 6 patients referred to, blood pressure readings were taken in 4 others; first, before the drug was administered and, then, fifteen to thirty minutes thereafter, with no reading immediately after its injection. The average pre-injection systolic pressure was 137 mm. of mercury and the average reading fifteen to thirty minutes later was 116 mm. indicating an average reduction of 21 mm. The diastolic pressure in 10 cases averaged

85 before the drug was administered and fifteen to thirty minutes later it had dropped to 76.

In the additional patients, one had a pre-injection blood pressure of 182 systolic over 100 diastolic which dropped to 164 systolic over 98 diastolic. In another patient the pressure dropped from 150 systolic over 100 diastolic to 120 systolic over 60 diastolic. Both of these cases were in severe status asthmaticus and the relief of symptoms together with the effects of the drug probably accounted for the marked reduction in blood pressure.

In 6 cases the average pulse rate recorded prior to administration of the drug was 102. In 2 cases the average pulse recorded immediately after the drug was given was 104. In 6 cases in which the pulse rate was recorded fifteen to thirty minutes after treatment it averaged 94 thus showing a reduction below the pre-treatment level.

Symptoms were evaluated in the same manner as after intramuscular injection of "E.N.E." The average improvement in all attacks in which the drug was used intravenously, was rated as 3, or, 75 per cent. In our opinion when one considers the severity of the attacks in this group the results were excellent.

In the 21 attacks treated, untoward effects were recorded on the basis of one to four, one representing a very trivial reaction and four being used to indicate that the patient had fainted. Reactions consisted of nervousness, fainting, and, in several instances, generalized skin erythema, perhaps caused by peripheral vasodilatation. None of the by-effects under consideration were sufficiently severe to present a serious or alarming problem. The average severity of untoward reactions is represented by the numeral, .718 plus, which being actually less than a one plus average, as can be seen readily, is of almost no significance.

Intravenously the drug has been effective in status asthmaticus in 5 instances after all of the usual measures (particularly intravenous injection of aminophylline and intramuscular injection of adrenalin) had failed. In 2 instances aminophylline was effectual when "E.N.E." was ineffectual. Rather consistently patients stated that they had less nervousness and "jitters" after "E.N.E." than they did after the intravenous administration of aminophylline. No records were kept of this, but it occurred sufficiently frequent to be rather striking.

Patient administration. It was soon realized that it would be necessary for the drug to be dispensed in a container suitable for administration by the patient, or by the patient's family and, at our request, the manufacturers prepared 30 cc. vials with rubber stoppers of the conventional type. Numerous patients have been given these for self-administration, intramuscularly.

In those instances where the patient had become accustomed to taking

adrenaline over a period of years, about 50 per cent expressed a preference for adrenalin and 50 per cent a preference for "E.N.E.", for self-administration. Those preferring adrenalin usually based their choice upon the fact that it is somewhat stronger and has a somewhat more prolonged effect. They were individuals, incidentally, who had almost no susceptibility to adrenalin and did not experience its pressor and central nervous system stimulating effects.

Practically every individual who was given "E.N.E." and, who had not been accustomed to taking adrenalin, preferred the former. In several of these, adrenalin was substituted for "E.N.E." as a test and, not one of them desired to continue with it, all of them reverting to the use of "E.N.E." Their major reason for selecting "E.N.E." was its freedom from pressor effects and central nervous system stimulation. This was particularly striking in children, in many of whom, a significant degree of excitement resulted from the use of epinephrine.

The practice with children has been to advise an initial dose ranging from 0.5 to 0.8 cc., depending upon the age of the child. In the event nervousness resulted, a reduction of 0.1 or 0.2 cc. almost invariably eliminated the reaction without loss of therapeutic efficacy.

The authors were unable to devise a system of keeping accurate records of the effect of "E.N.E." when administered by the patient or his family. Consequently, they were forced to be satisfied with close questioning of each patient to whom the drug was given and then endeavor to evaluate this in the best way possible. The foregoing evaluation represents the author's efforts along this line.

Representative cases. As mentioned earlier in this article, the unusual properties exhibited by "E.N.E.", namely low toxicity, lack of pressor effect, and freedom from central nervous system stimulation, suggested that it might be of value in children, in status asthmaticus and in hypertensive patients. Certain cases in this series seem to demonstrate that these hopes were justified.

Children. One child, 7 years of age, was sent into the hospital by an outside physician. He rapidly became febrile, the temperature reaching 105 upon the afternoon of admission. Chest roentgenographs were taken and pneumonia demonstrated. None of the usual measures controlled the patient's asthma which was of the grade of status asthmaticus. Incidentally, he had received several doses of morphine prior to his admission. Because the usual measures were unavailing, "E.N.E." was administered intravenously, 0.5 mg. in 10 cc. of salt solution after which the asthma rapidly subsided. The febrile reaction was likewise rapidly controlled by massive doses of penicillin, intramuscularly.

Another child age 18 months, was seen at his home during an asthmatic

paroxysm. Eight tenths of a cc. of "E.N.E." was given intramuscularly and, within ten or fifteen minutes, the episode had practically ceased. It was learned later that the child after having been put to bed had gone to sleep promptly. The next night the asthma recurred, and, because it was impossible for either of the authors to see the child, another physician was called. Adrenalin was given and the attack controlled quite readily. However, the child was made very nervous and an hour later, phenobarbital was required so that the child might go to sleep. Since then "E.N.E." has been employed by the child's parents innumerable times with complete satisfaction, and they refused to use adrenalin again, when this was urged by the attending pediatrician.

Hypertension. An elderly white female was seen by one of the authors in status asthmaticus; she was febrile and presented not only the signs of bronchial asthma, but of widespread, moderately severe bronchitis. During her stay in the hospital, the asthmatic symptoms reached a peak of severity several times. Because her blood pressure exceeded 200, it was felt that adrenalin was contraindicated. Consequently, aminophylline was given with good effect, but it caused considerable nervousness. "E.N.E." was then tried intravenously and it controlled the attack readily. It caused practically no nervousness and no pressor symptoms.

The patient was given "E.N.E." to take at home which she did with complete satisfaction and without untoward symptoms, until her supply was exhausted. Instead of requesting more, her family doctor insisted that she substitute adrenalin. The adrenalin was as effective as "E.N.E." but no more so in controlling the asthma but, as previously, it made her feel very badly generally with restlessness, nervousness and cardiac palpitation. The patient insists that "E.N.E." checks the asthma satisfactorily without causing unpleasant symptoms of any degree. Needless to say, in this patient with a markedly elevated blood pressure, adrenalin is contraindicated and "E.N.E." is definitely the drug of choice.

As discussed under intravenous administration, "E.N.E." in five cases was actually more effectual than other therapeutic agents. In addition, its almost total lack of toxicity when used with reasonable care, is quite striking. An interesting finding was that many patients who complained of nervousness following aminophylline tolerated "E.N.E." very well.

Method of Administration. Intramuscular—Patient administration. The authors' plan is to tell the patient to inject 1 cc. of "E.N.E.". For this purpose it is supplied in 30 cc. vials with rubber stoppers. In the event the first dose is not completely effective it may be repeated every twenty or thirty minutes as often as necessary until the attack has subsided. Patients are advised that they may take as much as 1.5 to 2.0 cc. intramuscularly, with perfect safety if there are no symptoms of stimulation of the

central nervous system. In those few patients complaining of nervousness, particularly children, a reduction of 0.1 or 0.2 cc. in the initial dose is advised.

Professional administration. The material is supplied in 1.0 cc. glass ampules, each of which contains 2 mg. of the drug, for the convenience of the physician who desires to carry a supply in his bag for home or hospital use.

Intravenous. At the request of the authors, the manufacturers prepared 20 cc. glass ampules containing 2 mg. of "E.N.E.". Using a 20 cc. syringe the dose may be slowly injected intravenously at a rate of about 2 to 3 cc. per minute thus requiring from 10 to 15 minutes to inject the entire contents of an ampule. However, it is believed that more rapid injection is possible with perfect safety, and the authors plan to administer the drug at the rate of either 4 or even 5 cc. per minute, depending upon the reaction of the patient. Many of them tolerate this speed of administration quite well.

Needless to say, all of the foregoing methods of administration of "E.N.E." must be adjusted to the individual patient under consideration.

SUMMARY

A new anti-asthmatic drug "E.N.E." has been tried in the Allergy Clinic of the School of Medicine, University of Maryland. It has an adrenalin-like action insofar as its anti-asthmatic properties are concerned but, in addition, it relaxes peripheral vessels actually causing a reduction rather than a rise in blood pressure. It has far less tendency than epinephrine to stimulate the central nervous system. "E.N.E." was given to patients varying in age from a few months to seventy years. It has been administered intramuscularly and intravenously and, has shown a surprising lack of toxicity in both circumstances.

The drug has been administered intramuscularly both by the professional staff and by the patients and their families; in addition, it has been used intravenously first in the hospital and later freely in the clinic and in the accident room without reactions of any degree of seriousness.

CONCLUSIONS

1. "E.N.E." is a valuable anti-asthmatic agent.
2. It has no pressor effect and, except in a few patients, has practically no stimulating effect upon the central nervous system.
3. It is particularly valuable in children because of its low toxicity and, because of its lack of stimulation of the central nervous system.
4. It is particularly useful in patients suffering with hypertension because of its lack of pressor qualities.
5. It can be given intravenously with practically complete safety if the proper dose and rate of administration is not exceeded.

6. Because of its low toxicity when intravenously injected, it is a valuable agent in status asthmaticus, not infrequently being effectual when all other measures have failed.

COMMENT

Whenever a new drug is suggested as an additional therapeutic agent in any condition, the natural tendency is to try it, initially, in those cases that have failed to respond to all of the conventional measures. The authors suggest that, when using "E.N.E." for the first time, physicians endeavor to select uncomplicated cases of bronchial asthma so that its true value may be demonstrated. When one has become familiar with the agent, the extension of its use to less clear-cut cases would seem to be warranted. The authors do not consider "E.N.E." an unfailing antiasthmatic agent but, rather, an additional drug which has a real place in the symptomatic control of asthma.

Hartman (5, 6) also reported favorably upon Butanefrine when used intramuscularly and by oral spray for the control of asthma.

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DEPARTMENT OF OBSTETRICS

CASE REPORT

This patient, a 26 year old primigravida, was admitted to the hospital on January 15, 1946, having been sent in by her physician because of painless vaginal bleeding. Her past and family histories were non-contributory. The pregnancy had been uneventful until the present episode of bleeding and the estimated date of confinement was March 1, 1946. The bleeding began about four hours prior to admission, and according to the patient, she lost about 2 cups of blood. She called her own physician, who, without any examination, immediately sent her to the hospital. Upon arrival bleeding had ceased and there was only some dark dried blood on her external genitalia. At no time during the pregnancy had she experienced any pain.

The general physical examination was negative, the pregnancy appeared to be of about thirty four weeks duration, the presentation was an L. O. A., with the fetal heart distinctly heard. The head was floating quite high. Her pulse was normal and the hemoglobin was 86 per cent (12.5 grms.). She was referred for radiologic placentography, after being typed and cross-matched for transfusion. The department of Roentgenography reported the placenta to be implanted very low, probably completely covering the internal os. Following this the patient was prepared for a sterile pelvic examination. The vagina contained a fair amount of old blood, there was no cervical erosion, the cervical canal was intact and the external os undilated. Careful and gentle palpation around the cervix demonstrated the presence of a boggy mass between the finger and the head of the baby. The diagnosis of placenta previa, probably centralis, was made. What should be the treatment of this case?

DISCUSSION

First the attending physician should be most heartily congratulated on his handling of this case. Painless bleeding in the last trimester of pregnancy is extremely indicative of placenta previa, a condition which requires treatment in a hospital. Nothing is to be gained by the examination of a patient of this kind, for irrespective of the findings, hospitalization should be insisted upon. On the other hand any internal examination, vaginal or rectal is very likely to inaugurate a severe or possibly fatal hemorrhage and also add to the risk of infection. Vaginal packing is also unwise, unnecessary and definitely dangerous.

Having been admitted, typed and cross-matched a diagnosis of placenta previa is made. What should be done now? A few years ago, the answer to this question would have been: Immediate delivery by the abdominal route. This would almost certainly, barring surgical accidents, assure us of a living, healthy mother. But the chances for a living infant of only 34 weeks gestation are none too good, and it is possible that it would not survive.

In recent years the tendency has grown to adopt a waiting policy in these cases, until the baby is nearer term. The type of delivery will not be changed, only the time when it is to be done. During this period of waiting it is possible that the patient will have one or more additional episodes of

bleeding. Therefore she should remain in the hospital, and if at any time the bleeding becomes great, or the hemoglobin falls to an alarming degree, an immediate transfusion should be given and delivery completed.

Those men who have been in practice for some time may find it difficult to reconcile themselves to this "expectant treatment", however statistics are rapidly accumulating from several clinics which indicate the safety of the method for the mother and a greatly increased chance for the baby. It must be remembered that if it is decided to wait in these cases, the patients must be very closely supervised and everything should be ready for prompt treatment should the occasion arise.

The ready availability of blood for transfusion is the one thing above all others which has made this method of treatment possible.

ACTUAL TREATMENT

As outlined above. The patient remained in the hospital for 4 weeks and then was delivered by an elective cesarean section. Both mother and baby made an uneventful recovery and left the hospital in good condition.

ANNUAL REPORT OF THE DEPARTMENT OF OBSTETRICS*†

FOREWORD

The report of the Department of Obstetrics which follows, is largely self explanatory and needs little if any elaboration. The number of patients cared for was 648 less than in 1944, the reduction being both in the home and hospital deliveries. In spite of this reduction, the facilities of the hospital and staff were greatly strained. A word of congratulation and sincere thanks is due the staff for the willingness and cheerfulness with which they assumed the extra burdens placed upon them and the manner in which the work was carried out.

A study of the Maternal Mortality Table for the past eight years is quite revealing in several ways. During the period the greatest number of deaths from any one cause was from hemorrhage (13 or 22 per cent of the total deaths). There were 12 deaths or 20.34 per cent as a result of cardiac disease or cardiac failure. Toxemias of pregnancy and anesthesia were responsible for 7 deaths each (11.86 per cent) and infection for 5 or 8.47 per cent of the total.

It would therefore appear that well over half of these deaths were preventable and ideally should not have occurred. It should be stated, though, that in quite a number of instances these patients were admitted to the hospital in a moribund condition, and the entire blame for their deaths should not be put upon this department. In other instances, the entire responsibility is ours.

ANNUAL REPORT

1945

Number of patients delivered and discharged (not including abortions).....	2312
Twins 23 sets	
White.....	1178
Colored.....	1134
In homes.....	395—17.08%
Twins 2 sets	
White.....	8
Colored.....	378
Registered.....	342
Unregistered.....	53
In hospital.....	1917—82.92%
Twins 21 sets	
White.....	1170
Colored.....	747

* From the Department of Obstetrics, School of Medicine, University of Maryland.

† Received for publication June 5, 1946.

Number of deliveries.....	Twins 23 sets.....	2335
White.....	1189	
Colored.....	1146	
Normal spontaneous.....	909—38.93%	
White.....	206	
Colored.....	703	
Operative deliveries (all in hospital).....	1426—61.07%	
White.....	985	
Colored.....	441	
Forceps.....	1287—55.12%	
White.....	898	
Colored.....	389	
High.....	0	
Mid.....	8	
Presentation occiput posterior.....	2	
Delivered following rotation.....	2	
Forceps.....	2	
Presentation occiput transverse.....	5	
Delivered following rotation.....	5	
Forceps.....	5	
Inertia-uterine.....	1	
Low.....	1279	
Control.....	945	
Presentation occiput posterior.....	119	
Delivered as such.....	65	
Delivered following rotation.....	54	
Spontaneous.....	4	
Manual.....	23	
Forceps.....	27	
Presentation occiput transverse.....	133	
Delivered following rotation.....	133	
Spontaneous.....	5	
Manual.....	64	
Forceps.....	64	
Other indications.....	82	
Labor prolonged.....	81	
Presentation brow.....	1	
Breech extraction.....	78—3.34%	
White.....	54	
Colored.....	24	
Internal podalic version and breech extraction.....	2—0.09%	
White.....	1	
Colored.....	1	
Presentation transverse.....	2	
Craniotomy.....	2	
Hydrocephalic monster.....	1	
Cephalopelvic disproportion labor prolonged— dead fetus.....	1	

Operation destructive.....	1
White.....	1
Colored.....	0
Presentation transverse cord-prolapse of.....	1
Cesarean section.....	53—2.27%
White.....	29
Colored.....	24
Classical.....	14
Placenta previa centralis.....	3
Placenta previa partialis.....	3
Placenta—premature separation of— normally implanted.....	2
Section previous with placenta under scar.....	1
Section previous and cephalopelvic dispro- portion.....	1
Cephalopelvic disproportion.....	2
Pelvis-contracted.....	1
Preeclampsia moderately severe.....	1
Laparotrachelotomy.....	38
Placenta previa centralis.....	4
Section-previous with placenta implanted under scar.....	2
Section previous and cephalopelvic dis- proportion.....	4
Cephalopelvic disproportion.....	17
Pelvis contracted.....	7
Dystocia because of pelvic tumor.....	1
Rectum-stricture of.....	1
Preeclampsia fulminating.....	1
Hypertensive cardiovascular disease-se- vere.....	1
Extraperitoneal (Water's).....	1
Cephalopelvic disproportion with labor prolonged.....	1
Laparotomy.....	3
Hysterorrhaphy.....	3
White.....	1
Colored.....	2
Uterus-rupture of.....	3
Abortions.....	81
Spontaneous.....	78
In homes.....	15
Registered.....	10
Cause undetermined.....	8
Syphilis-maternal.....	2
Unregistered.....	5
Cause undetermined.....	5

In hospital.....	63
Cause undetermined.....	51
Syphilis maternal.....	6
Rheumatic cardiovascular disease with failure.....	1
Nephritis—acute—glomerular.....	1
Diabetes mellitus—maternal.....	1
Placenta-premature separation of—normally implanted...	1
Hypothyroidism.....	1
Hypertensive disease.....	1
Therapeutic.....	3
Placenta previa partialis.....	1
Placenta previa marginalis.....	1
Placenta previa centralis.....	1
Other operations and procedures not including delivery.....	1975
Episiotomy.....	1233
Central.....	1194
Other.....	39
Perineorrhaphy.....	169
Indicated.....	147
Elective.....	22
Trachelorrhaphy.....	107
Indicated.....	35
Elective.....	72
Hysterostomy.....	11
Proto-perineorrhaphy.....	49
Head—manual rotation of.....	80
Head—forceps rotation of.....	83
Head—aftercoming—forceps to.....	20
Vaginal mucous membrane laceration—repair of.....	64
Placenta—manual removal of.....	14
Willett clamp-application of.....	22
Dilatation and curettage.....	7
Perineorrhaphy exploratory-needle in perineum (2 yrs.).....	1
Polyp-cervical—cauterization of.....	1
Recto-vaginal fistula—repair of.....	1
Vaginal laceration—cauterization of.....	4
Cervix—cauterization of.....	24
Vaginal cyst—excision of.....	2
Vaginal septum—ligation and division of.....	1
Cervix—biopsy of.....	1
Hematoma—perineal—incision and obliteration of.....	1
Sterilization.....	34
Pomeroy.....	33
Section previous.....	10
Heart disease.....	5
Multiparity.....	11
Cephalopelvic disproportion.....	2
Hypertensive disease.....	1
Tuberculosis—bone (tibia).....	1
Uterus—rupture of.....	3
Roentgen-ray.....	1

Section previous.....	1	
Labor—induction of by amniorrhexis.....	29	
Placenta—premature separation of.....	8	
Hypertensive disease.....	3	
Preeclampsia.....	4	
Eclampsia antepartum.....	1	
Placenta previa-centralis.....	1	
Placenta previa-marginalis.....	2	
Placenta previa-partialis.....	1	
Hemorrhage—antepartum—cause undetermined.....	4	
Mother—Rh negative with antibodies.....	1	
Nephritis chronic.....	1	
Postmaturity.....	1	
Convenience.....	2	
Laparotomy (suspected ruptured uterus).....	1	
Salpingo-oophorectomy.....	1	
Supravaginal hysterectomy (uterus rupture of).....	1	
Oophorectomy.....	1	
Ovary—dermoid cyst of—excision of.....	1	
Decapitation (fetus macerated—shoulder dystocia).....	1	
Bronchoscopy.....	1	
Saphenous ligation.....	3	
Phlebotomy.....	1	
Para-vertebral block.....	1	
Thoracentesis.....	1	
Pneumothorax.....	3	
Skull—biopsy of.....	1	
Number of patients discharged from hospital.....	2288	
Admitted from Prenatal Clinic.....	1055	
White.....	200	
Colored.....	855	
Reasons for admission:		
Normal.....	648	
Toxemia.....	102	
Preeclampsia.....	59	
Hypertensive disease.....	33	
Eclampsia intrapartum.....	1	
Hyperemesis gravidarum.....	6	
Chronic nephritis.....	2	
Unclassified.....	1	
Abortion.....	30	
Inevitable.....	23	
Threatened.....	7	
Hemorrhage vaginal—antepartum.....	48	
Hemorrhage postpartum.....	3	
Presentation breech.....	19	
Presentation compound.....	1	
Pregnancy multiple.....	11	
Pyelitis antepartum.....	11	
Rheumatic heart disease.....	5	
Labor premature.....	39	
Labor false.....	43	

Membranes—premature rupture of.....	14
Labor prolonged.....	1
Multiparity.....	11
Section previous.....	12
Diabetes mellitus.....	2
Anemia.....	1
Thrombophlebitis.....	1
Observation.....	8
Perineum—2nd degree laceration of.....	9
Hydramnios.....	2
Placenta retained.....	3
Cephalopelvic disproportion.....	5
Albuminuria—origin undetermined.....	1
Epilepsy.....	1
Endometritis puerperal.....	2
Cholecystitis—acute.....	1
Pain—abdominal—origin undetermined.....	1
Pelvis contracted.....	9
Schizophrenia.....	1
Perineum—laceration of complete—old.....	1
Vaginal mucous membrane laceration of.....	1
Edema—nutritional.....	1
Rectum—stricture of.....	1
Mastitis—puerperal.....	2
Xanthomatosis.....	1
Tuberculosis pulmonary.....	1
Cystitis.....	1
Reaction-sulfonamide.....	1
From other sources.....	1233
White.....	1184
Colored.....	49
Private patients.....	1120
Normal.....	830
Toxemia.....	46
Preeclampsia.....	23
Eclampsia antepartum.....	1
Hypertensive disease.....	12
Nephritis chronic.....	2
Hyperemesis gravidarum.....	8
Abortion.....	55
Inevitable.....	32
Threatened.....	18
Incomplete.....	5
Hemorrhage antepartum.....	18
Fistula recto-vaginal.....	1
Labor false.....	46
Labor premature.....	25
Labor prolonged.....	1
Pyelitis antepartum.....	4
Presentation breech.....	26
Pregnancy multiple.....	7

Rheumatic heart disease	8
Cephalopelvic disproportion	13
Observation	10
Heart—fetal, absence of	1
Section previous	5
Rectum—stricture of	1
Induction—medical	2
Multiparity	1
Pelvis—contracted	1
Mastitis—puerperal—acute	4
Membranes—premature rupture of	9
Postmaturity	2
Vein—saphenous—thrombosis of	1
Hemorrhage—postpartum	1
Secundines—retained	2
Unregistered service	113
White	64
Colored	49
Normal	51
Toxemia	10
Preeclampsia	1
Eclampsia	1
Hypertensive disease	4
Nephritis chronic	2
Hyperemesis gravidarum	2
Hemorrhage antepartum	16
Hemorrhage postpartum	2
Pregnancy multiple	1
Presentation breech	1
Observation	1
Placenta retained	1
Diabetes mellitus	1
Labor false	3
Mole hydatidiform	1
Abortion inevitable	9
Rheumatic heart disease	2
Endometritis puerperal	1
Labor prolonged	1
Perineum—2nd degree laceration of	1
Placenta retained	2
Pain—abdominal—severe	1
Hemorrhage—vaginal—intrapartum	1
Pyelitis—antepartum—acute	1
Pelvis contracted	1
Labor premature	3
Presentation transverse	1
Presentation face	1
Number of patients admitted	2277
Number of patients transferred	5
Medicine	3
Effusion pleural	1

Scarlet fever puerperal.....	1
Diabetes mellitus.....	1
Gynecology.....	2
Abortion incomplete.....	1
Fistula—recto-vaginal—recurrent.....	1
Number of patients delivered for other services.....	0
Number of viable babies.....	2335
In homes.....	397
White.....	8
Colored.....	389
In hospital.....	1938
White.....	1181
Colored.....	757
Full term living.....	2161—92.55%
In homes.....	386
White.....	7
Colored.....	379
In hospital.....	1775
White.....	1101
Colored.....	674
Full term dead.....	44—1.88%
In homes.....	2
White.....	1
Colored.....	1
Asphyxia.....	1
Asphyxia—intrauterine.....	1
In hospital.....	42
White.....	19
Colored.....	23
Lues maternal.....	8
Asphyxia intrauterine.....	11
Atelectasis congenital.....	1
Toxemia maternal.....	2
Hemorrhage intracranial.....	3
Erythroblastosis fetalis.....	2
Cause unknown.....	8
Hydrocephalus.....	1
Diabetes maternal—uncontrolled.....	1
Umbilical cord—prolapse of.....	3
Anencephalus.....	2
Premature living.....	113—4.84%
In homes.....	8
White.....	0
Colored.....	8
30 weeks spontaneous.....	2
32 weeks spontaneous.....	4
34 weeks spontaneous.....	1

30 weeks lues maternal.....	1
In hospital.....	105
White.....	50
38 weeks spontaneous.....	4
36 weeks spontaneous.....	14
34 weeks spontaneous.....	5
33 weeks spontaneous.....	1
32 weeks spontaneous.....	5
31 weeks spontaneous.....	1
30 weeks spontaneous.....	2
28 weeks spontaneous.....	1
38 weeks placenta previa.....	1
36 weeks placenta previa.....	2
30 weeks placenta previa.....	1
28 weeks placenta previa.....	1
36 weeks premature separation.....	3
34 weeks premature separation.....	2
32 weeks premature separation.....	2
37 weeks hypertensive disease.....	1
36 weeks hypertensive disease.....	1
32 weeks hypertensive disease.....	1
38 weeks preeclampsia.....	1
32 weeks preeclampsia.....	1
Colored.....	55
38 weeks spontaneous.....	5
37 weeks spontaneous.....	2
36 weeks spontaneous.....	9
34 weeks spontaneous.....	3
32 weeks spontaneous.....	9
30 weeks spontaneous.....	1
28 weeks spontaneous.....	2
38 weeks lues maternal.....	2
36 weeks lues maternal.....	1
33 weeks lues maternal.....	1
32 weeks lues maternal.....	1
38 weeks pregnancy multiple.....	4
36 weeks pregnancy multiple.....	2
38 weeks eclampsia.....	1
36 weeks placenta previa.....	2
32 weeks placenta previa.....	1
36 weeks premature separation.....	1
34 weeks premature separation.....	1
28 weeks premature separation.....	1
36 weeks preeclampsia.....	2
34 weeks preeclampsia.....	1
32 weeks preeclampsia.....	1
30 weeks preeclampsia.....	1
32 weeks nephritis chronic.....	1
Premature dead.....	17—0.73%
In homes.....	1

White.....	0	
Colored.....	1	
38 weeks maternal lues.....	1	
In hospital.....	16	
White.....	9	
36 weeks premature separation.....	1	
32 weeks premature separation.....	1	
30 weeks premature separation.....	1	
36 weeks—cord prolapse of—breech.....	1	
34 weeks cause unknown.....	1	
32 weeks hydrocephalus.....	1	
28 weeks anencephalus.....	2	
28 weeks eclampsia intrapartum.....	1	
Colored.....	7	
36 weeks lues maternal.....	1	
32 weeks lues maternal.....	1	
30 weeks lues maternal.....	1	
30 weeks cord prolapse of.....	1	
32 weeks anencephalus.....	1	
32 weeks hypertensive disease.....	1	
34 weeks cause unknown.....	1	
Deaths in live born babies.....	49—2.15%	
In homes.....	2	
White.....	0	
Colored.....	2	
Prematurity.....	2	
In hospital.....	47	
White.....	21	
Prematurity.....	6	
Prematurity and atelectasis.....	1	
Hemorrhage subarachnoid.....	4	
Atelectasis.....	1	
Diarrhea.....	5	
Congenital hemolytic disease of newborn.....	1	
Congenital anomalies—multiple.....	1	
Liver—abscess of multiple.....	1	
Cause unknown.....	1	
Colored.....	26	
Prematurity.....	11	
Prematurity and atelectasis.....	2	
Prematurity and subarachnoid hemorrhage.....	3	
Hemorrhage subarachnoid.....	4	
Atelectasis.....	1	
Diarrhea.....	2	
Edema cerebral.....	1	
Pulmonary artery—congenital stenosis of.....	1	
Mesenteric lymphadenitis—diffuse.....	1	
Fetal mortality.....	110—4.71%	
In homes.....	5	
In hospitals.....	105	

White.....	50	
Colored.....	60	
Maternal mortality.....		5—0.18%
In homes.....	0	
In hospital.....	5	
White.....	3	
Uterus-rupture of and puerperal sepsis.....	1	
Rheumatic heart disease with mitral stenosis and insufficiency with pulmonary edema—acute.....	1	
Placenta previa centralis with hemorrhage and shock....	1	
Colored.....	2	
Embolus—pulmonary (pelvic thrombosis?).....	1	
Pulmonary edema acute—aspiration during anesthetic—preeclampsia fulminating.....	1	
Deaths in registered clinic patients.....		2—0.14%
Deaths in unregistered clinic patients.....		1—0.59%
Deaths in private patients.....		2—0.17%
Rate per 1000 live births.....		2.19
Number of S.T.S. in registered clinic patients.....		1413
White.....	202	
Colored.....	1211	
Number of positive results.....		194—13.73%
White.....	4	
Colored.....	190	
Number of positive results treated.....		176
White.....	3	
Colored.....	173	
Full term alive.....		135—76.70%
38 weeks premature alive.....	4	
36 weeks premature alive.....	6	
33 weeks premature alive.....	1	
Full term dead.....	7	
38 weeks premature dead.....	1	
26 weeks abortion.....	3	
24 weeks abortion.....	1	
20 weeks abortion.....	1	
Undelivered.....	17	
Number of positive results not treated.....		18
White.....	1	
Colored.....	17	
Full term alive.....		9—50%
34 weeks premature alive.....	1	
32 weeks premature alive.....	1	
Full term dead.....	1	
36 weeks premature dead.....	1	
32 weeks premature dead.....	1	
30 weeks premature dead.....	1	

24 weeks abortion.....	1
15 weeks abortion.....	1
Postpartum admission.....	1
Number of patients without S.T.S.....	0
Complications—inside and outside services.....	2410
Complications maternal.....	2271
Placental.....	81
Placenta previa centralis.....	4
Placenta previa partialis.....	6
Placenta previa marginalis.....	4
Placenta abruptio.....	3
Placenta premature separation of—low implanted.....	13
Placenta premature separation of—normally implanted.....	23
Placenta retained.....	11
Placenta adherent.....	10
Cord prolapse of.....	7
Abnormal presentation and abnormal pelvis.....	415
Occiput posterior.....	126
Occiput transverse.....	138
Presentation breech.....	81
Presentation transverse.....	3
Presentation brow.....	1
Presentation chin.....	1
Presentation face.....	2
Presentation compound.....	1
Disproportion cephalopelvic.....	31
Pelvis—contraction of.....	31
Labor.....	410
Premature.....	121
Precipitate.....	13
Prolonged.....	145
False.....	92
Shock intrapartum.....	6
Shock postpartum.....	5
Uterus inertia of.....	6
Bandl's contraction ring.....	4
Uterus—rupture of.....	4
Uterus—inversion of.....	1
Uterus—bicornute.....	2
Cervix dysstocia of.....	2
Membranes—premature rupture of.....	9
Hemorrhage and blood dyscrasia.....	125
Anemia secondary.....	99
Hemorrhage antepartum.....	12
Hemorrhage intrapartum.....	3
Hemorrhage postpartum.....	11
Cardiovascular disease.....	15
Rheumatic.....	15
Toxemia.....	209

Hypertensive disease.....	101
Eclampsia.....	3
Preeclampsia.....	83
Nephritis chronic.....	6
Hyperemesis gravidarum.....	16
Infection.....	300
Genital tract.....	166
Infection puerperal.....	153
Infection intrapartum.....	4
Infection intra-abortal.....	1
Infection post-abortal.....	1
Perineum infection of.....	4
Vaginitis and vulvitis.....	2
Vulva—furuncle of.....	1
Urinary tract.....	60
Pyelitis antepartum.....	20
Pyelitis postpartum.....	39
Cystitis antepartum.....	1
Respiratory.....	43
Pneumonia.....	13
Lobar.....	5
Broncho.....	8
Tuberculosis pulmonary.....	9
Active.....	5
Arrested.....	4
Bronchitis acute.....	2
Respiratory acute—upper.....	12
Laryngitis acute.....	1
Asthma—chronic.....	4
Abscess pulmonary.....	1
Mouth—Vincent's infection of.....	1
Miscellaneous infection.....	31
Mastitis—nonsuppurative.....	12
Thrombophlebitis.....	3
Abdominal wound—infection of.....	2
Peritonitis pelvic.....	1
Inflammatory disease—pelvic.....	1
Salpingitis acute.....	1
Septicemia puerperal.....	3
Cholecystitis acute.....	1
Glomerulonephritis acute.....	1
Scarlet fever puerperal.....	1
Tuberculosis ilium—arrested.....	1
Tuberculosis tibia—arrested.....	1
Tooth-abscess of.....	2
Otitis media.....	1
R.V.O.....	22
Miscellaneous complications.....	694
Related to pregnancy.....	630
Vaginal mucous membrane laceration of.....	68
Cervix laceration of.....	107
Perineum laceration of.....	219

Rectum laceration of.....	49
Pregnancy multiple.....	23
Hydramnios.....	4
Perineum hematoma of.....	1
Ahortion missed.....	2
Abortion incomplete.....	5
Abortion threatened.....	25
Fistula recto-vaginal.....	3
Vaginal bleeding—origin undetermined.....	13
Edema—origin unknown.....	1
Cervix—erosion of.....	46
Hydatidiform mole.....	1
Varicose veins—thrombosis of.....	6
Psychosis postpartum.....	3
Section previous.....	17
Multiparity.....	26
Secundines retained.....	3
Albuminuria—cause unknown.....	2
Cervix—pólyp of.....	1
Ovary—dermoid cyst of.....	1
Cervix—septum of.....	1
Vagina—septum of.....	2
Miscellaneous complications not related to pregnancy.....	64
Diabetes mellitus.....	4
Epilepsy.....	4
Obesity.....	1
Condyloma acuminata.....	3
Rectum—stricture of.....	3
Reaction transfusion.....	1
Fibroids uterine.....	2
Deficiency mental.....	3
Rheumatic fever—acute.....	1
Atelectasis pulmonary.....	4
Paralysis facial.....	1
Scoliosis lumbar.....	1
Reaction sulfonamide.....	1
Lower extremities—atrophy of post polio.....	1
Lymphogranuloma venereum.....	2
Effusion pleural.....	2
Gastroenteritis.....	2
Anemia.....	1
Acidosis.....	1
Osteogenesis imperfecta.....	1
Hips—dislocation of—congenital.....	1
Arrest—respiratory—anesthesia.....	1
Ptyalism.....	1
Schizophrenia.....	3
Xanthomatosis.....	1
Emphysema mediastinal.....	1
Thrombosis saphenous.....	2
Malnutrition.....	1

Symphysis pubis—separation of.....	1
Embolism pulmonary.....	1
Infarction pulmonary.....	1
Retinitis hypertensive.....	2
Lung—multiple cysts of.....	1
Dermatitis contact.....	2
Cyst—Bartholin.....	3
Hernia umbilical.....	2
Hips—ankylosis of.....	1
Complications—fetal.....	139
Injuries and diseases.....	71
Hemorrhage intracranial.....	14
Hemorrhage subarachnoid.....	7
Asphyxia intrantrine.....	21
Atelectasis.....	13
Newborn anemia.....	2
Scalp hematoma of.....	4
Edema cerebral.....	2
Dehydration inanition fever.....	1
Hypoglycemia.....	3
Erb's paralysis.....	1
Congenital hemolytic disease of newborn.....	3
Infection.....	50
Diarrhea.....	21
Thrush.....	7
Impetigo.....	5
Conjunctivitis.....	5
Non-specific.....	1
Gonococcal.....	4
Liver—multiple abscess of.....	1
Septicemia—hemolytic staphylococcic.....	1
Mesenteric lymphadenitis.....	1
Pneumonia.....	5
Syphilis congenital.....	4
Developmental.....	18
Spina bifida.....	1
Hydrocephalus.....	1
Anencephalus.....	4
Mongolian idiocy.....	2
Talipes equino varus.....	2
Talipes calcaneo varus.....	1
Patent ductus arteriosus.....	1
Imperforate anus with rectum absence of.....	1
Obstruction laryngeal.....	1
Congenital stenosis pulmonary artery.....	1
Supernumerary digits.....	3

SUMMARY OF MATERNAL DEATHS

78527 An 18 year old, colored, para 0-0-0-0, was admitted to the hospital at about the seventh month of gestation with a diagnosis of pyelitis and anemia (hgb. 50%). Routine therapy was instituted. On the morning after admission, the patient had a

sudden pain in the chest with rapid, weak pulse and collapse. Death occurred in a few hours. Tentative diagnosis: embolus—pulmonary. Autopsy permission was refused.

Cause of death: Pulmonary embolus.

79596 A 38 year old, para 2-0-0-2, admitted to the University of Maryland Hospital 2-11-45 from another hospital where she had been in labor for 4 days and had been given several medical inductions with pituitary extract. On admission the patient was toxic and jaundiced. Her temperature was 99.8, pulse 128, respirations 38 and blood pressure 166 systolic over 100 diastolic. The abdomen was tense, the fetus was palpable in R.O.A. but the fetal heart was not heard. The patient was sedated, and given intravenous glucose and blood. She was anesthetized and examined vaginally. The cervix was fully dilated and a large macerated and hydrocephalic head was 2 cms. above the spines. A craniotomy was done followed by a spontaneous decapitation and delivery was completed by version and extraction. Following delivery a uterine rupture was found. A laparotomy was done, and the placenta was found loose in the abdominal cavity. A supra-vaginal hysterectomy was performed with a left salpingo-oophorectomy. The patient went into shock during which she was given 2500 cc of blood and 500 cc of plasma.

The postpartum course was stormy and death occurred at 7.10 a.m. 2-15-45.

Cause of death: Uterus, rupture of
Hemorrhage, intrapartum
Infection, intra and postpartum.

Autopsy: Traumatic vesico-vaginal fistula
Generalized peritonitis.

82665 A 31 year old, white, para 1-0-0-1, was admitted to the hospital 6-1-45 in early labor. The patient was known to have had rheumatic heart disease (mitral stenosis) since childhood and during pregnancy had several attacks of mild decompensation, with fibrillation beginning 10 days prior to admission. This responded fairly well to bed rest and digitalis. Labor in this case was uneventful, lasting 4 hours, with delivery by low forceps following episiotomy, under open drop ether. Puerperium was normal for 3 days with no cardiac symptoms. On the third day the patient was sterilized abdominally, again under open drop ether. Nine hours later severe pulmonary edema occurred. The patient went downhill rapidly and died on the 5th postpartum day. Autopsy permission was refused.

Cause of death: Cardiac collapse
Pulmonary edema.

84326 A 17 year old, colored, para 0-0-0-0 was admitted from the prenatal clinic because of a fulminating preeclampsia. During the routine treatment there was a moderate improvement. The day following admission, labor began spontaneously but because of a generally contracted gynecoid pelvis, the patient made no progress after more than 20 hours. It was decided to do an abdominal delivery (low cervical) and the patient was prepared and anesthetized (open drop ether). During induction she vomited and aspirated but appeared to recover and the operation was completed without incident. Four and one-half hours later she developed acute pulmonary edema and died.

Cause of death: Pulmonary edema acute (an anesthetic death).

85924 A 28 year old, white-unregistered, para 2-0-0-2, was admitted to the hospital at 4.15 a.m. 9-21-45 in deep shock following profuse intermittent vaginal bleeding of four hour's duration. The family and past histories were non-contributory. There was evidence of LMP in December of 1944 and EDC in September of 1945. Approximately one half hour after the onset of bleeding a midwife was called who examined the patient rectally and after several more episodes of bleeding called a physician who on seeing the

patient, referred her to the hospital immediately. On admission the patient was in deep shock, and was given 500 cc of plasma, was typed and cross-matched and shortly thereafter was given 500 cc of whole blood. The blood pressure rose from 0 to 64 systolic over 38 diastolic. The patient reacted, coughed and expelled a large clot from the vagina and again bled profusely. A classical cesarean section was done with the delivery of a full term, dead, female child, weighing 6 lbs. 7 oz. The uterus contracted well, following administration of ergotrate, grains 1/320 I.V. The placenta, located centrally over the cervical os, was removed manually. During the procedure the patient received 2000 cc of citrated whole blood. She responded slightly. Two hours after the operation the blood pressure rose to 100 systolic over 76 diastolic but the general condition remained critical. The pulse remained rapid and weak, the temperature rose to 103, and approximately 12 hours post-operative the respirations became shallow. At 10.05 a.m. on the following day, in spite of numerous transfusions and stimulants, the patient ceased to breathe.

Cause of death: Hemorrhage with shock-irreversible, as a result of placenta previa centralis.

MATERNAL MORTALITY COVERING EIGHT YEAR PERIOD

	1938	1939	1940	1941	1942	1943	1944	1945
Pregnancy, abdominal.....	1							
Abruptio placenta.....	2	1	1					
Shock, intrapartum (without hemorrhage).....	1							
Embolus, pulmonary.....	1							1
Infection, puerperal.....	1		2	1	1			
Uremia.....	1							
Reaction, transfusion.....	1							
Anesthetic.....	1	1	2			2		1
Heart disease, rheumatic-decompensation.....	1		1				1	1
Liver, acute yellow atrophy of.....		1						
Cardiovascular collapse.....		1	1	1	1	1		
Cardiac dilatation.....		1	1		1			
Uterus, rupture of.....		1	1	1		1		1
Hemorrhage, intracranial.....			1	2				
Arsphenamine encephalitis.....				1				
Tuberculosis.....				1	1		1	
Embolus, cerebral.....				1				
Leukemia, acute myeloid.....				1				
Eclampsia, ante and intrapartum.....				1			3	
Hemorrhage, postpartum.....						1	1	
Ileus, paralytic.....					1			
Adrenal gland, insufficiency of.....					1			
Preeclampsia, severe, with shock.....							1	
Placenta previa.....								1
Total.....	59	10	6	10	10	6	5	7
Rate per 1000 Live Births.....	5.4	3.0	4.4	3.9	2.0	1.6	2.4	2.19

POSTGRADUATE REVIEW COURSE IN GENERAL MEDICINE AND SURGERY, UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE

The School of Medicine of the University of Maryland offers a review course in general medicine and surgery to begin October 2, 1946, and to end November 27, 1946, similar to the refresher course offered this spring and just completed. The success of the first offering and the many inquiries as to when it would be repeated convinced the faculty that there is a real demand for such courses among our alumni. In the future this course will be offered once each year.

The course will not be given to less than fifteen and the enrollment will be limited to thirty. While open to graduates of any approved medical school, preference will be given to veterans who are graduates of the University of Maryland. No examinations will be given nor credit of any kind awarded as the course is not designed to prepare men for board certification.

Emphasis will be placed upon the recent developments in Medicine, Surgery, Pediatrics, Obstetrics and Gynecology and on a brief review of the fundamental principles in these fields. Material will be presented by the staffs of the departments concerned in the form of lectures, clinics, ward rounds, symposia and conferences (including pathologic) arranged for pertinent subjects. Because of the nature of the course, most of the teaching will be didactic but as much clinical material will be introduced as circumstances permit. The basic science departments will cooperate and from time to time offer special lectures covering material of clinical interest in their respective fields.

Written application for admission to the course must be made before September 20, 1946. All inquiries and applications should be addressed to the Office of the Dean, School of Medicine, University of Maryland, Baltimore 1, Maryland. Applications should include: (1) Applicant's name, age and permanent address; (2) a summary of military record; (3) medical school from which graduated, and date of graduation; (4) hospital training and previous medical experience. Students will provide their own living quarters and subsistence. Under Public Laws 346 and 16, veterans are entitled to tuition and the usual subsistence allowances providing a certificate of entitlement is obtained from the Veterans Administration. The Postgraduate Committee will be glad to give assistance in making these arrangements. Similarly, while the Committee can assume no responsibility for finding rooms, it will render what help it can in seeing that students are properly placed. The tuition fee is \$100.00.

RUTH LEE BRISCOE—IN TRIBUTE*

IDA MARIAN ROBINSON

On July 1, 1914, a new librarian took charge of the Library of the University of Maryland in Davidge Hall; on July 1, 1946, that same librarian, Mrs. Ruth Lee Briscoe, retired after thirty-two years of loyal service. Scarcely a handful of medical librarians throughout the country can equal her record or match the parade of events that have taken place within the walls of her library.

In reviewing Mrs. Briscoe's career from the beginning, it seems more by nature than by accident that she became a librarian. Her father was the well-known John W. M. Lee, who had a distinguished career as librarian of the Maryland Historical Society for twenty years and subsequently became librarian and curator for the late T. Harrison Garrett. It was Mr. Lee who was sent abroad to purchase the Calvert papers concerning the early history of Maryland. Thus Mr. Lee's Baltimore born daughter grew up in a scholarly atmosphere of which books were an integral part. It was some time, however, before she realized that she was to follow in her father's footsteps professionally.

In 1902 Ruth Lee married Charles A. W. Briscoe, a member of the Baltimore Bar, and devoted the following ten years to family and social life, the rearing of a son. With the sudden death of her husband in 1912, Mrs. Briscoe's professional career began to take shape.

She took a position as librarian at the Phipps Psychiatric Clinic, Johns Hopkins Hospital, beginning her duties there on the day that the clinic first opened. This was followed later by special work at the Sheppard and Enoch Pratt Hospital, helping to prepare the index of the oldest American psychiatric journal, the *American Journal of Insanity*, under the direction of its editor, Edward N. Brush.

In 1914, when the Board of Regents was seeking a competent person to take charge of the Library of the University of Maryland in Davidge Hall, Dr. Brush and Miss Marcia Noyes of the Medical and Chirurgical Faculty Library recommended Mrs. Briscoe for the position because of her background, her experience, and her personal qualities. Thus she became the third official librarian of the oldest medical college library in the United States.

At the time Mrs. Briscoe became librarian, Davidge Hall contained not only the medical book collection, but the libraries of the Schools of Law, Dentistry, and Pharmacy as well. Later, for a brief period, the library of the

* From the Library. School of Medicine, University of Maryland.

School of Commerce was added, putting Mrs. Briscoe in the unique position of librarian in charge of five different special library collections, the only known consolidated science and law library.

The School of Commerce very soon withdrew; later Dentistry and Pharmacy; and eventually, after eighteen years, the Law School—each to go into its own building with its own librarian. The medical books and Mrs. Briscoe remained.



RUTH LEE BRISCOE

Besides the varying book collections, Mrs. Briscoe has seen many changes in the library during her thirty-two year reign. She has been there through four alterations and restorations of the old church building that became a library. Her memory of the interior when the librarian's desk stood upon a dais under the stained-glass windows, facing across the dim reading room towards the original church gallery at the front, is quite different from today's picture of a well-lighted room with modern library equipment, galleries around three sides opening into various offices and rooms for special collections.

Over the years Mrs. Briscoe has seen the building put to many uses besides that of housing a library. For a time, one of the library rooms was used for a law professor's office, and a Practice Court of Law was held weekly in an adjoining room. At one period, a basement room was used as a store for the sale of law books. The same basement served at intervals as a Y. M. C. A. gymnasium; mess hall for the S. A. T. C. in World War I; a Red Cross work-room; and finally the Babies' and Children's Clinic. In all of these, in turn, Mrs. Briscoe took the lively interest which marks all of her activities. Eventually the day came when the entire building was occupied by the library alone, and the medical book collection spread from basement to upper galleries.

During the earlier years of Mrs. Briscoe's direction, the growth of the library was slow and difficult. There were practically no funds for books and increase in the book collection was largely dependent on gifts from publishers, authors, alumni, and other friends of the library. Under these circumstances, Mrs. Briscoe's personal qualities of friendliness and helpfulness did much to prompt gifts of money and books for the library. It was because of the stimulating quality of the librarian's interest that the morning mail sometimes contained a letter of this kind:*

Dear Mrs. Briscoe,

Have always wished to express my appreciation of your many kindnesses to me as a medical student.

Enclosed check for fifty dollars . . . for whatever purpose connected with the Library you desire.

For those who know the library only in its present flourishing state, with an adequate book budget to supply books regularly, it may be difficult to realize what the efforts of the librarian meant in preserving, cultivating, and increasing the library in that long period of lean years. Despite the difficulties, Mrs. Briscoe has seen the collection of medical books increase, since the beginning of her regime, to about five times its size at that time.

It has been not in the acquisition of books alone that Mrs. Briscoe has used her talents in adding to the library. With her keen interest in the historical, she has done much to obtain items of interest in the history of the school and the library: pictures, maps, portraits, early diplomas, and letters. There are some amazing stories in this connection, too numerous to relate here, such as the rescue of the fine portrait of Nathaniel Potter, done by St. Memin, from the coal cellar where it lay face down, discarded. Not only was this portrait saved by Mrs. Briscoe to adorn the library wall, but it was photographed by the Frick Art Museum of New York.

Perhaps the most remarkable group of pictures acquired entirely through Mrs. Briscoe's efforts is the one including a beautifully designed Mortality

* Quoted from a letter written by Dr. Max Trubek.

Roll and portraits and biographies of all of the University's men and women who gave their lives in World War I.

Because of the increased space required for the book collection, many of the pictures which once hung on the walls of the library have been removed, to be carefully preserved in a picture file, a tribute to Mrs. Briscoe's success in collecting them.

With the beginning of World War II, the librarian directed another project. This was the safeguarding of the library's famed Crawford Collection, the original book collection purchased in 1813 for five hundred dollars, now valued in the thousands. Under Mrs. Briscoe's personal supervision and with her help, every volume of the Crawford Collection was individually wrapped and carefully packed away in sturdy crates, to be sent to safe keeping for the duration. When the books were returned at the end of the war, not one had suffered any damage from the packing and transportation.

Mrs. Briscoe's interest in the traditional and historical has never kept her from having progressive ideas and advancing with the times. During her librarianship, the library has changed from a closely locked reference library of limited use to an intensely active circulating one. Instead of clinging to old time medical classifications, good in their day but now out-moded, the library has turned to a modern and expanding classification system to meet present day needs. Mrs. Briscoe has taken great interest in interlibrary loans, also, and has handled them in ever increasing numbers, both borrowing from and loaning to other libraries extensive material for use in research. From the day when she was asked her first reference question—she still remembers what it was: a request for material on mycetoma (madura foot)—throughout the entire thirty-two years of her librarianship, Mrs. Briscoe has aimed for progress in the library.

Despite such an active career as a librarian, Mrs. Briscoe has found time for a great variety of other interests. She enjoys the collecting hobby and indulges in it in several different fields, perhaps the most notable of which is miniature books. Her extensive collection of miniature books has been exhibited for the interest of the public on various occasions, as well as being the subject of a radio talk given by Mrs. Briscoe from a Baltimore station.

Another of her hobbies is geneological research; she has written four volumes of geneology. But her literary talent is not confined to one subject. She wrote and edited *The Life and Letters of John Lee*; contributed two articles to the famous *Dictionary of American Biography*; wrote *A History of the Library of the University of Maryland, 1813-1938* for the *Bulletin of the School of Medicine*; and contributed various articles to other publications of the University and to newspapers.

At home Mrs. Briscoe takes great pleasure in needlework and gardening. She is fond of social life, actively interested in music, the theatre, all forms of

art. She is a member of the Board of the Washington-Custis Chapter of the Daughters of the American Revolution.

Anyone who could see the letters received by Mrs. Briscoe from all parts of the world from "her boys" (and girls, too) would realize that the important thing in her long library career has been not the mere administration of a library, but rather her interest in people and their reactions to her friendliness. For thirty-two years, students have confided in Mrs. Briscoe and found her sympathetic; they remember her for that personal responsiveness rather than for the books that she passed across the desk to them. It is for her individual quality of personality that letters come to her from every continent in the stress of war time, sent by the grown up boys who remember her with affection.

Many people, while they congratulate Mrs. Briscoe upon her success as a librarian, will do it with warmth because of her success as a human being. That is the greatest tribute.

PROCEEDINGS
of the
University of Maryland Biological Society

Officers of the Society

William E. Hahn, *President*
School of Dentistry
Baltimore, Md.

Marie A. Andersch, *Treasurer*
School of Medicine
Baltimore, Md.

Rupert S. Anderson, *Secretary*
School of Medicine
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Ronald Bamford, *Secretarial Representative*
Department of Botany
College Park, Md.

Councilors

Robert H. Oster
E. G. Schmidt
M. S. Aisenberg
G. S. Weiland

ONE HUNDRED AND FIFTIETH PROGRAM MEETING

The One Hundred and Fiftieth Program Meeting was held on Wednesday, May 22, 1946 at 4:00 P.M. in the Library, third floor Bressler Building.

A paper on *Blood and Urinary Phenols* was presented by Emil G. Schmidt and Jane L. Banker of the Department of Biochemistry, School of Medicine.

All Program Meetings are Open to the Public.

ONE HUNDRED AND FIFTY-FIRST PROGRAM MEETING

The One Hundred and Fifty-First Program Meeting was held on Wednesday, April 17, 1946 at 4:00 P.M. in the Library, third floor Bressler Building.

A paper on *Oral Penicillin with Basic Aluminum Aminoacetate* was presented by William E. Evans, Jr., of the Department of Pharmacology, School of Medicine.

ONE HUNDRED AND FIFTY-SECOND PROGRAM MEETING

The One Hundred and Fifty-Second Program Meeting was held on Wednesday, March 20, 1946 at 4:00 P.M. in the Library, third floor Bressler Building.

A paper on *Experimental Studies on Tridione and Other New Anticonvulsant Drugs* was presented by Guy M. Everett of the Abbott Laboratories.

ALUMNI ASSOCIATION SECTION

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The names listed above are officers for the term beginning July 1, 1945 and ending June 30, 1947

COMMENCEMENT EXERCISES

The School of Medicine, University of Maryland and the College of Physicians and Surgeons and the School of Nursing, University of Maryland held its commencement exercises at The Lyric, Baltimore, Friday evening, March Twenty-second at eight o'clock, nineteen hundred and forty-six.

The order of exercises was as follows:

- I. THE PROCESSION: *The Coronation March*, Meyerbeer; *Pomp and Circumstance*, Elgar.
- II. INVOCATION: THE REV. RICHARD H. BAKER, *Rector of the Protestant Episcopal Church of the Redeemer of Maryland.*
- III. GREETINGS: ROBERT U. PATTERSON, M.C., C.M., LL.D., *Dean, School of Medicine*; H. C. BYRD, B.S., LL.D., Sc.D., *President, University of Maryland*; HON. HERBERT R. O'CONOR, A.B., LL.B., LL.D., *Governor of Maryland.*
- IV. THE ADDRESS: MAURICE C. PINCOFFS, B.S., M.D., *Professor of Medicine.*

V. CONFERRING OF DEGREES: PRESIDENT H. C. BYRD.

School of Medicine: Candidates were presented by DEAN ROBERT U. PATTERSON.

Presentation of Commissions in Medical Corps, A.U.S.: CAPTAIN PHILIP

E. BIEGE, A.U.S., Commandant, 3316th Service Command Unit.

Presentation of Commissions in Medical Corps, U.S.N.R.: H. S. HURT, CAPTAIN, U.S.N.

Presentation of Graduates: DR. GLENN S. WEILAND, Assistant Professor of Biochemistry.

Class Roll—School of Medicine

Jeanne Dorothy Amlicke	Herbert Joseph Levickas
Jesse Hoyt Arnold, Jr.	Allan Harris Macht
Charles Henry Audet, Jr.	Leonard Thomas Maholick
Robert Joseph Audet	Raymond Law Markley, Jr.
William James Bannen, Jr.	Charles Benton Marshall, Jr.
Robert Edward Bauer	George Yellott Massenburg
Walter Jose Benavent	Otto Stevens Matthews
Alfred Dement Bonifant	Robert Eugene May
Lowell Russell Brosemer	George Charles McElfatrick
Eli Matthew Brown	Thomas Coatsworth McPherson
Robert Ray Brown	Clarence Emmanuel Mc-
Louise Paddon Buckner	Williams, Jr.
Harold Vernon Cano	Joseph Herman Mintzer
William Francis Carr	John Armitage Mitchell
Thomas West Christopher	John Edward Morrison
Sidney Gary Clyman	Jerome D'Anneo Nataro
Francis Ignatius Codd	Pomeroy Nichols, Jr.
Jerome Elias Cohn	Ellsworth Howard North, Jr.
Thomas Byrne Connor	James Stewart O'Hare
Richard Joseph Cross, Jr.	William Werner Orrison
Walter Lee Crouch	Horace Henry Osborne
Joseph D'Antonio	Arthur John Owen
Jose Diaz-Carazo	William Favre Park
Guy Kenneth Driggs	Earl Rupert Paul
Vincent Offley Eareckson, Jr.	Clemmer Marcus Peck
Herman Lee Earnhardt, Jr.	Lois Irene Platt
James Lee Eavey	John Calvin Rawlins
Joseph Samuel Fischer	Milton Reisch
Paul Eugene Frye	Ralph Alan Reiter
Samuel David Gaby	Robert Annan Riley, Jr.
John Reeves Gamble, Jr.	James Alwin Roberts
William Daniel Gentry, Jr.	Robert Crittenden Rossberg
James Johnson Gerlach	Sidney Sacks
Abraham Aaron Goetz	James Anderson Sewell
Harry William Gray	Frank Anthony Shallenberger,
Duane Leonard Greenfield	Jr.
Leland Jay Hansen	David Nicholson Sills, Jr.
Henry Carter Hardin, Jr.	Edward Milton Smith, Jr.
John Barker Harley	Edward Patrick Smith, Jr.
Charles William Hawkins	Clinton Wolfe Stallard, Jr.
Charles Arthur Hefner	Herbert Van Arden Swindell
Edwin Okey Hendrickson, III	Leon Toby
Harry Edward Hill	James Anderson Vaughn, Jr.
J. Poulson Hunter	Elliott Lionel Weitzman
Nathan Bernard Hyman	Irl Jesse Wentz
Erwin Reeves Jennings	Walter McIlhaney Wolfe, Jr.
August Kiel, Jr.	Joseph Berkeley Workman
H. G. Robert Knapp	Alexander William Young, Jr.
Lawrence Joseph Knox	Richard Atlee Young
John Howard Latimer	

School of Nursing: Candidates were presented by MISS FLORENCE M. GIPE, M.S., R.N., Director of the School of Nursing.

Class Roll—School of Nursing

Mary Eleanor Colarusso
Anna Lee DeHaven
Dorothy Simpson Duvall
Marion Phyllis Duvall
Dorothy Reachard Funk
Irene Chenette Holljes
Albena Margaret Janovich

Ruth Nell Jordan
Mary Elizabeth Klevisher
Adeline Rosalie Mosberg
Ann Mary Pierpont
Marion Yvonne Ramsey
Margaret May Stoner
Sarah Elizabeth Weimer

VI. AWARDING OF HONORS—School of Medicine: DR. ROBERT U. PATTERSON, *Dean*.

UNIVERSITY PRIZE GOLD MEDAL

Milton Reisch

CERTIFICATES OF HONOR

Leon Toby	Jerome Elias Cohn	Joseph Herman Mintzer
Samuel David Gaby	Sidney Gary Clyman	

VII. ADMINISTERING OF OATH: DR. J. MASON HUNDLEY, JR., *Professor of Gynecology*.

SPONSIO ACADEMICA

I, ..., having received the required instruction in medical science and now qualified to receive a degree, do promise in the presence of a Holy God, Searcher of Hearts, that I will to the last breath of life continue in the duties of one grateful to the University and that furthermore I will employ my skill in medicine cautiously, conscientiously and honorably and, that so far as in me lies, I will faithfully look after all those things that are helpful in bringing about the health of bodies that are sick, and finally that I will not without urgent reason divulge those things either seen or heard during medical practice which should be kept secret. So may the Divine Being be present to witness by oath.

VIII. BENEDICTION: THE REV. RICHARD H. BAKER, *Rector of the Protestant Episcopal Church of the Redeemer of Maryland*.

IX. THE RECESSIONAL: *March of the Priests*, Mendelssohn.

OBITUARIES

DR. EMERSON WINFIELD AYARS

Dr. Emerson Winfield Ayars (P. & S. 1895) died in Miami, Florida April 2, 1946 at the age of 79 years. Dr. Ayars was born in Dodge Center, Minnesota. He was educated in schools of that town, and Walworth, Wisconsin, taught school in Minnesota, New York and New Jersey, graduated from Alfred University, Alfred, New York June 1891, and the College of Physicians and Surgeons, June 1895. He first practiced medicine at Richburg, New York for 10 years and later at Alfred, New York for 13 years. Dr. Ayars served as a Captain in the U. S. Medical Corps from April 1918 to January 1919. After the war he practiced at Coconut Grove and Miami, Florida until his death. He was active in civic affairs all his life and served as Coroner in Allegany County, New York for 13 years. Dr. Ayars was City Commissioner of Coconut Gove and instigated the erection of the first treated-drinking water plant in South Florida at that place. He served as School Trustee for 3 years and was elected a member of the Dade County Board of Public Instruction in 1932, serving one term.

DR. WILLIAM E. EVANS

Dr. William E. Evans, Jr., Associate Professor of Pharmacology of the School of Medicine, University of Maryland died in the University Hospital on May 6th after an illness of short duration. He was 40 years old. Dr. Evans was a native of Brunswick, Maryland. He did his undergraduate work at George Washington University and received his masters degree from that institution in organic chemistry. He joined the staff of the School of Medicine in 1929 as Assistant in Pharmacology and received his Ph.D. degree from the University of Maryland in 1936. His rank was successively increased to Assistant and Associate Professor.

Dr. Evans' researches have related to carbohydrate metabolism, drugs in hypertension and in more recent years in the field of anesthesia. He is the author of at least 50 articles in the scientific and medical literature. At the time of his demise, he was engaged in writing a textbook of Pharmacology. Dr. Evans held membership in the Society of Pharmacology and Experimental Therapeutics, and the International Association of Torch Clubs.

COLONEL FRANK W. WILSON

Colonel Frank W. Wilson, (Class of 1914) commanding officer of Moore General Hospital, died at his home on the post following a short illness. The body was sent to Washington, D. C. where a military funeral was held at Fort Myer's chapel. Interment followed in Arlington National Cemetery.

Officials at Moore Hospital attributed his death to an acute attack of

coronary thrombosis, and said he was stricken as he was preparing to get out of bed.

Colonel Wilson, a native of Greenville, N. C., had commanded Moore General Hospital since its activation in October, 1942. While under his command it became well-known as a tropical disease center. Many times during the war years, it was set forth as one of the model hospitals within the jurisdiction of the Fourth Service Command, comprising the South-eastern states. Colonel Wilson was alerted for Pacific duty last August 15, but on August 24 the order was rescinded and he was retained as the hospital's commanding officer.

A graduate of the School of Medicine, University of Maryland, he attended the Army Medical College, the Medical Field Service school, and took the advanced course for medical officers. He entered service as a first lieutenant in the Medical Reserve Corps in 1915. He served in France with the First Division during World War I. Since that time he had been in administrative work in army hospitals. Colonel Wilson served in Hawaii, at Beaumont, Texas, at Fitzsimmons General Hospital, Denver, Colo., at Walter Reed General Hospital, Washington, D. C., at Fort Benning, Ga., and finally at Camp Shelby, Miss. before coming to Moore General Hospital.

In July 1941 he was appointed to the temporary rank of colonel. On June 7, 1942 he was appointed to the permanent rank of colonel in the Medical Corps.

Colonel Moore held the Legion of Merit and a number of commendations and campaign bars among other decorations. Under his command, the hospital received the Meritorious Service award recently.

Bailey, Harry, Hartford, Conn.; class of 1922; aged 47; died, January 12, 1946, of acute peritonitis and septicemia.

Bayard, Clayton H., Orono, Me.; P. & S., class of 1892; aged 79; died, January 14, 1946, of cerebral hemorrhage.

Bize, Louis A., Tampa, Fla.; B.M.C., class of 1895; aged 74; died, January 9, 1946, of congestive heart failure.

Booth, Harold Thomas, Schroon Lake, N. Y.; class of 1936; aged 34; served during World War II; died, in England, on August 30, 1945, of pulmonary tuberculosis.

Bowerman, Edwin A., Buffalo, N. Y.; P. & S., class of 1895; aged 74; died, October 22, 1945, of cerebral hemorrhage.

Boyer, Horace Russell, Glendale, Calif.; class of 1903; aged 68; died, November 9, 1945, of coronary thrombosis.

Brownfield, George H., Fairmont, W. Va.; P. & S., class of 1898; aged 74; died, March 21, 1946, of heart disease.

Burfoot, Archibald McDowell, Fentress, Va.; B.M.C., class of 1906;

- aged 61; died, November 25, 1945, of angina pectoris and hypertension.
- Causey, Henry Dickinson**, Fairmont, W. Va.; class of 1911; served during World War I; aged 64; died, December 12, 1945, of heart disease.
- Gochenour, George S.**, Moorefield, W. Va.; B.M.C., class of 1889; aged 88; died, December 17, 1945, of senility.
- Hoag, John Morley**, Baltimore, Md.; P. & S., class of 1902; aged 70; died, January 10, 1946, of coronary thrombosis.
- Jacoby, Aaron**, Steubenville, O.; class of 1919; died suddenly on March 15, 1946, while working in his office.
- Lauder, Charles E.**, Viroqua, Wisc.; class of 1891; served during World War I; aged 79; died, December 6, 1945, in Rochester, Minn., of general peritonitis and ulcerative colitis.
- Lawler, William Patrick**, Lowell, Mass.; P. & S., class of 1886; aged 86; died, December 7, 1945, of coronary occlusion.
- Lee, John C.**, Wyalusing, Pa.; B.M.C., class of 1897; aged 75; died, January 22, 1946, of heart disease.
- Magness, Samuel Lee**, Baltimore, Md.; class of 1902; aged 67; died, November 27, 1945, of cerebral hemorrhage.
- Marr, Frank T.**, Chillicothe, O.; P. & S., class of 1901; aged 68; died, October 28, 1945, of cerebral hemorrhage.
- McGraw, Henry Richardson**, Denver, Colo.; class of 1901; aged 72; served during World War I; died, December 6, 1945.
- Nichols, Samuel Arthur**, Clarksville, Md.; B.M.C., class of 1897; aged 75; died, November 2, 1945, of coronary thrombosis.
- Rigney, Lawrence Joseph**, Wilmington, Del.; class of 1920; aged 55; died, November 28, 1945, of rupture of the esophageal varix and cirrhosis of the liver.
- Savage, Philip Joseph**, New London, Conn.; class of 1921; aged 52; served during World Wars I and II; contracted amebic dysentery while overseas; relieved from active duty August 29, 1944; died, August 2, 1945.
- Smith, Charles Urban**, Baltimore, Md.; class of 1889; aged 77; died, November 12, 1945.
- Stevens, Harry Laurence**, New Bedford, Mass.; B.M.C., class of 1891; aged 75; died, January 29, 1946, of hypertension.
- Tubbs, Alva Brown**, Cadiz, O.; P. & S., class of 1897; aged 76; died, February 1, 1946, after an illness of several months with a heart ailment and complications.
- Weatherly, Ossie Alexander**, Bluefield, W. Va.; B.M.C., class of 1909; aged 67; died, November 27, 1945, of coronary thrombosis.
- Young, John Perry**, Chester, S. C.; class of 1894; aged 75; died, November 29, 1945, of pneumonia and nephritis.

BULLETIN
OF THE
SCHOOL *of* MEDICINE
UNIVERSITY OF MARYLAND

SEPTEMBER, 1946



PUBLISHED FIVE TIMES A YEAR
(JANUARY, APRIL, JULY, SEPTEMBER AND OCTOBER)

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NOTE

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Made in United States of America

Entered as second-class matter June 16, 1916, at the Postoffice at Baltimore, Maryland,
under the Act of August 24, 1912.



BALTIMORE SCHOOLS—UNIVERSITY OF MARYLAND

1. Original Medical Building
2. Laboratory Building, Medicine
3. Bressler Building, Medicine
4. Gray Laboratory, Student's Lounge, Medicine
5. Administration Building, College of Education,
Baltimore Division
6. Medical Library
7. University Hospital
8. Nurses' Home, Medicine
9. School of Pharmacy
10. School of Dentistry
11. Dental Clinic
12. Out-Patient Clinics, Medicine
13. School of Law

BULLETIN
OF THE
SCHOOL *of* MEDICINE
UNIVERSITY OF MARYLAND



Announcement

The One Hundred Forty-First Academic Session
1946-1947

Catalogue

The One Hundred Fortieth Academic Session
1945-1946

SEPTEMBER, 1946

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CALENDAR

ACADEMIC YEAR—SEPTEMBER 5, 1946 TO JUNE 7, 1947

1946

August 28, 29, 30	Re-examinations for advancement
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FIRST SEMESTER—September 5, 1946 to January 25, 1947

September 3	Tuesday	*Registration, payment of fees, freshmen and sophomores
September 4	Wednesday	*Registration and payment of fees by all other students
September 5	Thursday	Instruction begins at 8:30 A.M.
November 28, 29, 30		Thanksgiving recess
December 20	Friday	Instruction suspended 5:00 P.M.
		Christmas recess

1947

January 6	Monday	Instruction resumed 8:30 A.M.
January 20	Monday	Midyear examinations, all classes
to		*Payment of fees for second semester
January 25	Saturday	First semester completed 2:00 P.M.

SECOND SEMESTER—January 27 to June 7, 1947

January 27	Monday	Instruction begins at 8:30 A.M.
February 22	Saturday	Washington's Birthday—Holiday
April 3 to 9		Easter recess
May 12	Monday	Senior examinations begin 9:00 A.M.
May 26	Monday	Junior examinations begin 9:00 A.M.
May 30	Friday	Memorial Day—Holiday
May 31	Saturday	Announcement of graduates
June 2	Monday	Sophomore and Freshman examinations begin 9:00 A.M.
June 6	Friday	Second semester completed at 5:00 P.M.
		Pre-Commencement Exercises at Lyric 8:00 P.M.
June 7	Saturday	Graduation at College Park at 11:00 A.M.

PARTIAL CALENDAR

ACADEMIC YEAR—SEPTEMBER 4, 1947 TO JUNE 5, 1948

August 27, 28, 29	Re-examinations for advancement
September 2	Tuesday
	*Registration and payment of fees by sophomores and freshmen
September 3	Wednesday
	*Registration and payment of fees by all other students
September 4	Thursday
	Instruction begins at 8:30 A.M.

* A student who fails to register prior to or within the day or days specified will be called upon to pay a late registration fee of five dollars (\$5.00). The last day of registration with fee added to regular charges is Saturday of the week in which registration begins.

The offices of the registrar and comptroller are open daily from 9:00 A.M. to 5:00 P.M., and Saturday from 9:00 A.M. to 12:00 noon.

ORGANIZATION

THE UNIVERSITY OF MARYLAND

HARRY CLIFTON BYRD, B.S., LL.D., D.Sc., *President and Executive Officer*

BOARD OF REGENTS

	<i>Term Expires</i>
WILLIAM P. COLE, JR., <i>Chairman</i>	Baltimore 1949
THOMAS R. BROOKES, <i>Vice-Chairman</i>	Bel Air 1952
STANFORD Z. ROTHSCHILD, <i>Secretary</i>	Baltimore 1952
J. MILTON PATTERSON, <i>Treasurer</i>	Baltimore 1953
E. PAUL KNOTTS	Denton 1954
GLENN L. MARTIN	Baltimore 1951
CHARLES P. MCCORMICK	Baltimore 1948
HARRY H. NUTTLE	Denton 1950
PHILIP C. TURNER	Baltimore 1950
MILLARD E. TYDINGS	Washington, D. C. 1951
MRS. JOHN L. WHITEHURST	Baltimore 1947

Members of the Board are appointed by the Governor of the State for terms of nine years each, beginning the first Monday in June.

The President of the University of Maryland is, by law, Executive Officer of the Board.

A regular meeting of the Board is held the last Friday in each month, except during the months of July and August.

Each school has its own Faculty Council, composed of the Dean and members of its faculty; each Faculty Council controls the internal affairs of the group it represents.

The University has the following educational organizations:

At Baltimore The School of Dentistry The School of Law The School of Medicine The School of Nursing The School of Pharmacy At College Park The College of Agriculture The College of Arts and Sciences	The College of Commerce The College of Education The College of Engineering The College of Home Economics The Graduate School The Department of Military Science and Tactics The Department of Physical Education and Recreation The Summer School
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FACULTY OF MEDICINE

EMERITI

J. FRANK CROUCH, M.D. . . . Professor of Clinical Ophthalmology and Otology, Emeritus
 HARRY FRIEDENWALD, A.B., M.D., D.H.L., D.Sc. . Professor of Ophthalmology, Emeritus
 WILLIAM S. GARDNER, M.D. Professor of Gynecology, Emeritus
 J. M. H. ROWLAND, M.D., D.Sc., LL.D.

Professor of Obstetrics, Emeritus; Dean, Emeritus

J. DAWSON REEDER, M.D. Professor of Proctology, Emeritus
 HENRY J. WALTON, M.D. Professor of Roentgenology, Emeritus
 PAGE EDMUNDS, M.D. Professor of Traumatic Surgery, Emeritus
 RUTH LEE BRISCOE Librarian, Emeritus

FACULTY BOARD

H. BOYD WYLIE, *Acting Dean*

WILLIAM R. AMBERSON	ANDREW C. GILLIS	D. J. PESSAGNO
FRANKLIN B. ANDERSON	HENRY F. GRAFF	H. R. PETERS
RUBERT S. ANDERSON	FRANK W. HACHTEL	MAURICE C. PINCOFFS
JAMES G. ARNOLD, JR.	*O. G. HARNE	J. G. M. REESE
THOMAS B. AYCOCK	CYRUS F. HORINE	CHARLES A.
WALTER A. BAETJER	J. MASON HUNDLEY, JR.	REIFSCHNEIDER
CHARLES BAGLEY, JR.	ELLIOTT H. HUTCHINS	COMPTON RIELY
J. MCFARLAND BERGLAND	EDWARD S. JOHNSON	HARRY M. ROBINSON, SR.
CHARLES F. BLAKE	F. L. JENNINGS	HARRY L. ROGERS
OTTO C. BRANTIGAN	C. LORING JOSLIN	MILTON S. SACKS
HOWARD M. BUBERT	HUGH W. JOSEPHS	EMIL G. SCHMIDT
T. NELSON CAREY	WALTER L. KILBY	ARTHUR M. SHIPLEY
C. JELLEFF CARR	EDWARD A. KITLOWSKI	DIETRICH C. SMITH
THOMAS R. CHAMBERS	JOHN C. KRANTZ, JR.	R. DALE SMITH
CARL DAME CLARKE	LOUIS A. M. KRAUSE	WILLIAM H. SMITH
ROSS McC. CHAPMAN	KENNETH D. LEGGE	IRVING J. SPEAR
CLYDE A. CLAPP	R. W. LOCHER	HUGH R. SPENCER
PAUL W. CLOUGH	G. CARROLL LOCKARD	THOMAS P. SPRUNT
RICHARD G. COBLENTZ	EDWARD A. LOOPER	W. HOUSTON TOULSON
BEVERLY C. COMPTON	WILLIAM S. LOVE, JR.	RALPH P. TRUITT
CHARLES N. DAVIDSON	JOHN F. LUTZ	EDUARD UHLENHUTH
CARL L. DAVIS	STANLEY H. MACHT	HENRY F. ULLRICH
LOUIS H. DOUGLASS	HOWARD J. MALDEIS	ALLEN F. VOSHELL
FREDERICK C. DYE	N. CLYDE MARVEL	GRANT E. WARD
C. REID EDWARDS	CHARLES W. MAXSON	C. GARDNER WARNER
MONTÉ EDWARDS	JAMES C. McALPINE	HUNTINGTON WILLIAMS
FRANK H. J. FIGGE	ZACHARIAH MORGAN	WALTER D. WISE
LEON FREEDOM	THEODORE H. MORRISON	THOMAS C. WOLFF
EDGAR B. FRIEDENWALD	EMIL NOVAK	ROBERT B. WRIGHT
THOMAS K. GALVIN	THOMAS R. O'ROURK	GEORGE H. YEAGER
MOSES GELLMAN	ROBERT H. OSTER	WAITMAN F. ZINN
	C. W. PEAKE	

EXECUTIVE COMMITTEE OF THE FACULTY

H. BOYD WYLIE, *Acting Dean*

LOUIS H. DOUGLAS

J. MASON HUNDLEY, JR.

CHARLES REID EDWARDS

MAURICE C. PINCOFFS

FRANK W. HACHTEL

ARTHUR M. SHIPLEY

HUGH R. SPENCER

FACULTY OF MEDICINE

PROFESSORS

William R. Amberson, Ph.D., Professor of Physiology.

Thomas B. Aycock, B.S., M.D., Professor of Clinical Surgery.

Charles Bagley, Jr., M.A., M.D., Professor of Neurological Surgery.

†Harvey G. Beck, M.D., D.Sc., Professor of Clinical Medicine.

Charles F. Blake, M.A., M.D., Professor of Proctology.

Otto C. Brantigan, B.S., M.D., Professor of Surgical Anatomy, Associate Professor of Surgery.

Ross McC. Chapman, M.D., Professor of Psychiatry.

Clyde A. Clapp, M.D., Professor of Ophthalmology.

Richard G. Coblentz, M.A., M.D., Clinical Professor of Neurological Surgery.

†Albertus Cotton, M.A., M.D., Professor of Orthopaedic Surgery, and Roentgenology.

Carl L. Davis, M.D., Professor of Anatomy.

Brice M. Dorsey, D.D.S., Professor of Oral Surgery, School of Dentistry.

Louis H. Douglass, M.D., Professor of Obstetrics.

†Page Edmunds, M.D., Professor of Traumatic Surgery.

Charles Reid Edwards, M.D., Professor of Surgery.

Monte Edwards, M.D., Clinical Professor of Surgery and Proctology.

H. K. Fleck, M.D., Clinical Professor of Ophthalmology.

Edgar B. Friedenwald, M.D., Professor of Clinical Pediatrics.

Thomas K. Galvin, M.D., Clinical Professor of Gynecology.

Joseph E. Gichner, M.D., Professor of Clinical Medicine and Physical Therapeutics.

Andrew C. Gillis, M.A., M.D., LL.D., Professor of Neurology.

Frank W. Hachtel, M.D., Professor of Bacteriology.

J. Mason Hundley, Jr., M.A., M.D., Professor of Gynecology.

Elliott H. Hutchins, M.A., M.D., Professor of Surgery.

F. L. Jennings, M.D., Professor of Clinical Surgery.

It is to be noted that for convenience of reference the names of the members of the Faculty are listed in the forepart of this catalogue in alphabetical order. The names are listed in order of seniority under each preclinical and clinical department of the school on subsequent pages.

On the lists of the Faculty of Medicine and Fellows and the Hospital and Dispensary staffs are given the names and positions assigned during the session July 19, 1945 to May 25, 1946 unless otherwise indicated. Changes are noted as follows:

★ On leave, military service.

* Promotions.

† Appointments.

‡ Resignations.

§ Deaths—dates of.

C. Loring Joslin, M.D., Professor of Pediatrics.
 Walter L. Kilby, M.D., Professor of Roentgenology.
 Edward A. Kitlowski, A.B., M.D., Clinical Professor of Plastic Surgery.
 John C. Krantz, Jr., Ph.D., D.Sc., Professor of Pharmacology.
 Kenneth D. Legge, M.D., Professor of Clinical Genito-Urinary Surgery.
 G. Carroll Lockard, M.D., Professor of Clinical Medicine.
 Edward A. Looper, M.D., D.Oph., Professor of Rhinology and Laryngology.
 Theodore H. Morrison, M.D., Clinical Professor of Gastro-Enterology.
 Thomas R. O'Rourke, M.D., Clinical Professor of Otolaryngology, Associate in Rhinology and Laryngology.
 D. J. Pessagno, A.B., M.D., Professor of Clinical Surgery.
 H. Raymond Peters, A.B., M.D., Professor of Clinical Medicine.
 Maurice C. Pincoffs, B.S., M.D., Professor of Medicine.
 Charles A. Reifschneider, M.D., Clinical Professor of Traumatic Surgery and †Oral Surgery
 Compton Riely, M.D., Clinical Professor of Orthopaedic Surgery.
 Harry M. Robinson, Sr., M.D., Professor of Dermatology.
 Arthur M. Shipley, M.D., D.Sc., Professor of Surgery.
 Irving J. Spear, M.D., Professor of Neurology.
 Hugh R. Spencer, M.D., Professor of Pathology.
 Thomas P. Sprunt, A.B., M.D., Professor of Clinical Medicine.
 W. Houston Toulson, M.Sc., M.D., Professor of Genito-Urinary Surgery.
 Eduard Uhlenhuth, Ph.D., Professor of Anatomy.
 Allen Fiske Voshell, A.B., M.D., Professor of Orthopaedic Surgery.
 Huntington Williams, M.D., Dr. P.H., Professor of Hygiene and Public Health.
 Walter D. Wise, M.D., Professor of Surgery.
 H. Boyd Wylie, M.D., Professor of Biological Chemistry and Assistant Dean.
 Waitman F. Zinn, M.D., Clinical Professor of Rhinology and Laryngology.

ASSOCIATE PROFESSORS

Franklin B. Anderson, M.D., Associate Professor of Rhinology and Laryngology, and Otolaryngology.
 *James G. Arnold, Jr., M.D., Associate Professor of Neurological Surgery.
 Walter A. Baetjer, A.B., M.D., Associate Professor of Medicine.
 J. McFarland Bergland, B.S., M.D., Associate Professor of Obstetrics.
 T. Nelson Carey, M.D., Associate Professor of Medicine and Physician in Charge of Medical Care of Students.
 C. Jelleff Carr, Ph.D., Associate Professor of Pharmacology.
 Thomas R. Chambers, A.B., M.D., Associate Professor of Surgery.
 Carl Dame Clarke, M.A., Associate Professor of Art as Applied to Medicine.
 Paul W. Clough, B.S., M.D., Associate Professor of Medicine.
 *Charles N. Davidson, M.D., Associate Professor of Roentgenology.
 †Frederick C. Dye, M.D., Associate Professor of Anaesthesiology.
 †Edward C. Dobbs, D.D.S., Associate Professor of Oral Surgery, School of Dentistry.
 §William Ellsworth Evans, Jr., Ph.D., Associate Professor of Pharmacology.
 Frank H. J. Figge, Ph.D., Associate Professor of Gross Anatomy.
 Leon Freedom, M.D., Associate Professor of Neurology and †Instructor in Pathology.
 Moses Gellman, B.S., M.D., Associate Professor of Orthopaedic Surgery.
 T. Campbell Goodwin, M.S., M.D., Associate Professor of Pediatrics.

‡D. James Greiner, B.S., M.D., Associate Professor of Pathology.
 †William E. Hahn, D.D.S., Associate Professor of Oral Surgery, School of Dentistry.
 O. G. Harne, Associate Professor of Histology.
 Cyrus F. Horine, M.D., Associate Professor of Surgery.
 Edward S. Johnson, M.D., Associate Professor of Surgery.
 Hugh W. Josephs, M.D., Associate Professor of Pediatrics.
 †Charles C. W. Judd, M.D., Associate Professor of Medicine.
 Vernon D. Kaufman, D.D.S., Associate Professor of Oral Surgery, School of Dentistry.
 Louis A. M. Krause, M.D., Associate Professor of Medicine.
 R. W. Locher, M.D., Associate Professor of Clinical Surgery.
 William S. Love, Jr., A.B., M.D., Associate Professor of Medicine, †Instructor in Pathology.
 Howard J. Maldeis, M.D., Associate Professor of Legal Medicine and Associate in Pathology.
 †Frederick B. Mandeville, M.D., Associate Professor of Roentgenology.
 N. Clyde Marvel, A.B., M.D., Associate Professor of Surgery.
 Charles W. Maxson, M.D., Associate Professor of Surgery.
 †Sydney R. Miller, B.S., M.D., Associate Professor of Medicine.
 James G. McAlpine, Ph.D., Associate Professor of Bacteriology.
 Emil Novak, A.B., M.D., D.Sc., Associate Professor of Obstetrics.
 Robert H. Oster, Ph.D., Associate Professor of Physiology.
 C. W. Peake, M.D., Associate Professor of Surgery.
 J. G. M. Reese, M.D., Associate Professor of Obstetrics.
 Harry L. Rogers, M.D., Associate Professor of Orthopaedic Surgery.
 Emil G. Schmidt, Ph.D., LL.B., Associate Professor of Biological Chemistry.
 Dietrich Conrad Smith, Ph.D., Associate Professor of Physiology.
 William H. Smith, M.D., Associate Professor of Clinical Medicine.
 Ralph P. Truitt, M.D., Associate Professor of Psychiatry.
 Henry F. Ullrich, M.D., D.Sc., Associate Professor of Orthopaedic Surgery.
 Grant E. Ward, A.B., M.D., Associate Professor of Surgery and Oral Surgery.
 C. Gardner Warner, A.B., M.D., Associate Professor of Pathology.
 J. Herbert Wilkerson, M.D., Associate Professor of Oral Surgery, School of Dentistry.
 Robert B. Wright, B.S., M.D., Associate Professor of Pathology.
 †Lawrence F. Woolley, M.D., Associate Professor of Psychiatry.
 George H. Yeager, B.S., M.D., Associate Professor of Surgery.

ASSISTANT PROFESSORS

Thurston R. Adams, M.D., Assistant Professor of Surgery and *Proctology.
 Ruert S. Anderson, Ph.D., Assistant Professor of Physiology.
 H. F. Bongardt, M.D., Assistant Professor of Surgery.
 J. Edmund Bradley, B.S., M.D., Assistant Professor of Pediatrics.
 Leo Brady, A.B., M.D., Assistant Professor of Gynecology.
 Simon H. Brager, M.D., Assistant Professor of Surgery and †Associate in Proctology.
 H. M. Bubert, M.D., Assistant Professor of Medicine.
 †Murray M. Copeland, M.D., Assistant Professor of Surgery.
 Ross Davies, M.D., M.P.H., Assistant Professor of Hygiene and Public Health.
 J. S. Eastland, A.B., M.D., Assistant Professor of Medicine.
 Francis A. Ellis, A.B., M.D., Assistant Professor of Dermatology.
 Maurice Feldman, M.D., Assistant Professor of Gastro-Enterology.
 A. H. Finkelstein, M.D., Assistant Professor of Pediatrics.
 *Francis W. Gillis, M.D., Assistant Professor of Genito-Urinary Surgery.

Harry Goldsmith, M.D., Assistant Professor of Psychiatry.

*Albert E. Goldstein, M.D., Assistant Professor of Pathology.

Henry F. Graff, A.B., M.D., Assistant Professor of Ophthalmology.

Lewis P. Gundry, A.B., M.D., Assistant Professor of Medicine.

Harry C. Hull, M.D., Assistant Professor of Surgery.

*Harry K. Iwamota, Ph.D., Assistant Professor of Pharmacology.

Albert Jaffe, M.D., Assistant Professor of Pediatrics.

John E. Legge, M.D., Assistant Professor of Medicine.

John F. Lutz, A.B., M.D., Assistant Professor of Histology.

†Stanley H. Macht, B.S., M.D., Assistant Professor of Roentgenology.

*Howard B. Mays, M.D., Assistant Professor of Genito-Urinary Surgery and Instructor in Pathology.

Walter C. Merkel, A.B., M.D., Assistant Professor of Pathology.

Zachariah Morgan, M.D., Assistant Professor of Gastro-Enterology.

Samuel Morrison, A.B., M.D., Assistant Professor of Gastro-Enterology.

Harry M. Murdock, B.S., M.D., Assistant Professor of Psychiatry.

George McLean, M.D., Assistant Professor of Medicine.

James W. Nelson, M.D., Assistant Professor of Surgery.

H. W. Newell, M.D., Assistant Professor of Psychiatry.

M. Alexander Novey, A.B., M.D., Assistant Professor of Obstetrics.

§Benjamin Pushkin, M.D., Assistant Professor of Neurology.

I. O. Ridgely, M.S., M.D., Assistant Professor of Surgery.

Harry M. Robinson, Jr., B.S., M.D., Assistant Professor of Dermatology, Assistant in Medicine.

Milton S. Sacks, B.S., M.D., Assistant Professor of Medicine and Head of Clinical Pathology.

*John E. Savage, B.S., M.D., Assistant Professor of Obstetrics.

Richard T. Shackelford, A.B., M.D., Assistant Professor of Surgery.

Isadore A. Siegel, A.B., M.D., Assistant Professor of Obstetrics.

Edward P. Smith, M.D., Ph.G., Assistant Professor of Gynecology.

Frederick B. Smith, M.D., Assistant Professor of Pediatrics.

†R. Dale Smith, Ph.D., Assistant Professor of Gross Anatomy.

‡George A. Strauss, Jr., M.D., Assistant Professor of Gynecology.

John H. Traband, M.D., Assistant Professor of Pediatrics.

I. Ridgeway Trimble, M.D., Assistant Professor of Surgery.

*W. Wallace Walker, M.D., Assistant Professor of Surgery and Surgical Anatomy.

William H. F. Warthen, A.B., M.D., Assistant Professor of Hygiene and Public Health.

¹Glenn S. Weiland, Ph.D., Assistant Professor of Biological Chemistry.

Thomas C. Wolff, Litt.B., M.D., C.M., Assistant Professor of Medicine.

†Asa D. Young, M.D., Assistant Professor of Roentgenology.

ASSOCIATES

Margaret B. Ballard, M.D., Associate in Obstetrics.

Dudley P. Bowe, A.B., M.D., Associate in Obstetrics.

Kenneth B. Boyd, A.B., M.D., Associate in Gynecology and Assistant in Obstetrics.

Beverley C. Compton, A.B., M.D., Associate in Gynecology.

W. A. H. Councill, M.D., Associate in Genito-Urinary Surgery.

E. Eugene Covington, M.D., Associate in Surgical Anatomy and Surgery.

¹ Resigned August 31, 1946.

§ Died September 8, 1945.

- *D. McClelland Dixon, M.D., Associate in Obstetrics and Instructor in Pathology.
 John C. Dumler, B.S., M.D., Associate in Gynecology.
 William W. Elgin, M.D., Associate in Psychiatry.
 J. J. Erwin, M.D., Associate in Gynecology.
 Houston Everett, M.D., Associate in Gynecology.
 L. K. Fargo, M.D., Associate in Genito-Urinary Surgery.
 Wetherbee Fort, M.D., Associate in Medicine.
 Frank J. Geraghty, A.B., M.D., Associate in Medicine.
 Samuel S. Glick, M.D., Associate in Pediatrics.
 *George Govatos, A.B., M.D., Associate in Surgery.
 §*Georg K. Gülck, M.D., Associate in Pharmacology.
 Raymond F. Helfrich, A.B., M.D., Associate in Surgery.
 John T. Hibbitts, M.D., Associate in Gynecology.
 John F. Hogan, M.D., Associate in Genito-Urinary Surgery.
 Z. Vance Hooper, M.D., Associate in Gastro-Enterology.
 Clewell Howell, B.S., M.D., Associate in Pediatrics.
 *D. Frank Kaltreider, A.B., M.D., Associate in Obstetrics.
 *Joseph V. Jerardi, B.S., M.D., Associate in Surgery.
 Joseph I. Kemler, M.D., Associate in Ophthalmology.
 F. Edwin Knowles, Jr., M.D., Associate in Ophthalmology.
 *Harry V. Langeluttig, A.B., M.D., Associate in Medicine.
 Philip F. Lerner, A.B., M.D., Associate in Neurology.
 Luther E. Little, M.D., Associate in Surgery.
 Hans W. Leowald, M.D., Associate in Psychiatry.
 H. Edmund Levin, B.S., M.D., Associate in Bacteriology*, Instructor in Medicine.
 G. Bowers Mansdorfer, B.S., M.D., Associate in Pediatrics.
 Lyle J. Millan, M.D., Associate in Genito-Urinary Surgery.
 Frank K. Morris, A.B., M.D., Associate in Gynecology*, Instructor in Obstetrics.
 W. Raymond McKenzie, M.D., Associate in Rhinology and Laryngology.
 Hugh B. McNally, B.S., M.D., Associate in Obstetrics.
 Frank N. Ogden, M.D., Associate in Biological Chemistry.
 *Dexter L. Reimann, B.S., M.D., Associate in Pathology, Assistant in Medicine.
 Benjamin S. Rich, A.B., M.D., Associate in Otology and in Rhinology and Laryngology.
 William F. Rienhoff, Jr., M.D., Associate in Surgery.
 William M. Seabold, A.B., M.D., Associate in Pediatrics.
 William B. Settle, M.D., Associate in Surgery, Instructor in Surgical Anatomy, ‡Instructor in Gynecology.
 ‡Harry S. Shelley, B.S., M.D., Associate in Genito-Urinary Surgery.
 Arthur G. Siwinski, A.B., M.D., Associate in Surgery.
 Sol Smith, M.D., Associate in Medicine.
 ‡Cleo D. Stiles, M.D., Associate in Rhinology and Laryngology, and Assistant in Otology.
 E. H. Tonolla, M.D., Associate in Medicine.
 John A. Wagner, B.S., M.D., Associate in Pathology, Instructor in Neurological Surgery* and Assistant in Medicine.
 Austin H. Wood, M.D., Associate in Genito-Urinary Surgery.

LECTURERS

- Jonas Friedenwald, M.A., M.D., Lecturer in Ophthalmic Pathology.
 Charles R. Goldsborough, M.A., M.D., Lecturer in Medicine.

§ Died July 23, 1946.

Leslie B. Hohman, M.D., Lecturer in Psychiatry.

‡James C. Munch, Ph.D., Lecturer in Elementary Biometrics.

*Myron G. Tull, A.B., M.D., M.P.H., Lecturer in Hygiene and Public Health.

Clark H. Yeager, M.D., Dr. P.H., Lecturer in Tropical Medicine.

INSTRUCTORS

Conrad B. Acton, B.S., M.D., Instructor in Medicine and Pathology.

Marie A. Andersch, Ph.D., Instructor in Medicine.

A. Russell Anderson, M.D., Instructor in Psychiatry.

†Carl E. Bailey, D.D.S., Instructor in Prosthetic Dentistry, School of Dentistry.

Nathaniel M. Beck, A.B., M.D., Instructor in Pharmacology†, Assistant in Medicine and Gastro-Enterology.

†Eugene S. Bereston, A.B., M.D., Instructor in Dermatology.

Roland E. Bieren, M.D., Instructor in Pathology†, Assistant in Gynecology.

Harry C. Bowie, B.S., M.D., Instructor in Surgery and Surgical Anatomy*.

Thomas S. Bowyer, A.B., M.D., Instructor in Gynecology and Assistant in Obstetrics.

*George H. Brouillet, B.S., M.D., Instructor in Surgery.

Ann Virginia Brown, A.B., Instructor in Biological Chemistry.

†Samuel H. Bryant, A.B., D.D.S., Instructor in Oral Diagnosis, School of Dentistry.

Henry F. Buettner, M.D., Instructor in Bacteriology.

Harold H. Burns, M.D., Instructor in Surgery.

M. Paul Byerly, M.D., Instructor in Pediatrics.

Lucile J. Caldwell, M.D., Instructor in Dermatology.

*Mary E. Chinn, A.B., Instructor in Physiology.

Ernest I. Cornbrooks, Jr., A.B., M.D., Instructor in Gynecology.

Edward F. Cotter, M.D., Assistant in Neurology and ‡Instructor in Pathology.

Stuart G. Coughlan, B.S., M.D., Instructor in Surgery.

J. G. N. Cushing, M.D., Instructor in Psychiatry.

B. Matthew Debuskey, M.D., Instructor in Pediatrics.

W. Allen Deckert, A.B., M.D., Instructor in Gynecology and Assistant in Surgery and †Obstetrics.

‡S. J. Demarco, M.D., Instructor in Surgery.

Francis G. Dickey, A.B., M.D., Instructor in Medicine.

William K. Diehl, B.S., M.D., Instructor in Gynecology.

*Everett S. Diggs, B.S., M.D., Instructor in Gynecology.

Ernest S. Edlow, A.B., M.D., Instructor in Gynecology.

William L. Fearing, M.D., Instructor in Neurology.

Jerome Fineman, M.D., Instructor in Pediatrics.

Philip D. Flynn, M.D., Instructor in Medicine.

*Samuel L. Fox, M.D., Instructor in Rhinology, Laryngology and Otology.

*Irving Freeman, B.S., M.D., Instructor in Medicine.

William L. Garlick, A.B., M.D., Instructor in Surgery.

†William L. Guyton, M.D., Instructor in Pathology.

E. M. Hanrahan, A.B., M.D., Instructor in Surgery.

Mary L. Hayleck, M.D., Instructor in Pediatrics.

*Robert F. Healy, M.D., Instructor in Surgery.

William G. Helfrich, B.S., M.D., Instructor in Medicine.

‡Samuel T. Helms, B.S., M.D., Instructor in Medicine and Genito-Urinary Surgery.

¹ Nov. 1, 1945, ‡ June 30, 1946.

- W. Grafton Hersperger, A.B., M.D., Instructor in Medicine.
 *Benjamin Highstein, M.D., Instructor in Dermatology.
 F. A. Holden, M.D., Instructor in Ophthalmology.
 *Mark B. Hollander, M.D., Instructor in Dermatology.
 †Helen A. Horn, A.B., M.D., Instructor in Pathology.
 Calvin Hyman, M.D., Instructor in Surgery.
 †B. Wallace Inman, D.D.S., Instructor in Oral Surgery, School of Dentistry.
 Conrad L. Inman, D.D.S., Consulting Dentist.
 Meyer W. Jacobson, M.D., Instructor in Medicine.
 †Joye J. Jennings, A.B., Instructor in Physiology.
 †William R. Johnson, M.D., Instructor in Surgery.
 Edward S. Kallins, B.S., M.D., Instructor in Medicine.
 Clyde F. Karns, B.S., M.D., Instructor in Surgery.
 *Fayne A. Kayser, M.D., Instructor in Rhinology and Laryngology.
 †Howard F. Kinnamon, M.D., Instructor in Surgery.
 Lester N. Kolman, M.D., Instructor in Dermatology.
 *Vernon E. Krah, B.S., M.S., Instructor in Gross Anatomy.
 A. Kremen, A.B., M.D., Instructor in Ophthalmology.
 *Frederick R. Kyper, M.D., D.Sc., Instructor in Rhinology and Laryngology.
 Milton C. Lang, M.D., Instructor in Ophthalmology.
 Arnold F. Lavenstein, Instructor in Pediatrics.
 C. Edward Leach, M.D., Instructor in Medicine.
 Samuel Legum, A.B., M.D., Instructor in Medicine.
 Kurt Levy, M.D., Instructor in Medicine.
 Ephraim T. Lisansky, A.B., M.D., Instructor in Pathology, Assistant in Medicine.
 I. H. Maseritz, M.D., Instructor in Orthopaedic Surgery.
 R. B. Mitchell, Jr., B.S., M.D., Instructor in Medicine.
 J. Duer Moores, B.S., M.D., Instructor in Surgery.
 Ruth Musser, M.S., Instructor in Pharmacology.
 John A. Myers, M.E.E., M.D., Instructor in Medicine, Assistant in Gastro-Enterology.
 Francis McLaughlin, M.D., Instructor in Psychiatry.
 Samuel Novey, M.D., Instructor in Psychiatry.
 †Paul Padget, M.D., Instructor in Medicine.
 *William A. Parr, M.D., Instructor in Otology
 †Eugene L. Pessagno, A.B., D.D.S., Instructor in Operative Surgery, School of Dentistry.
 Herbert E. Reifschneider, A.B., M.D., Instructor in Surgery and †Surgical Anatomy,
 †Instructor in Oral Surgery.
 Robert A. Reiter, A.B., M.D., Instructor in Medicine.
 Daniel R. Robinson, M.D., Instructor in Surgery.
 John F. Schaefer, B.S., M.D., Instructor in Surgery.
 Kathryn L. Schultz, M.D., Instructor in Psychiatry.
 *Theodore A. Schwartz, M.D., Instructor in Rhinology and Laryngology.
 Lawrence M. Serra, M.D., Instructor in Medicine.
 †A. Albert Shapiro, B.S., M.D., Instructor in Dermatology.
 *Robert C. Sheppard, M.D., Instructor in Surgery.
 M. S. Shiling, A.B., M.D., D.Sc., Instructor in Medicine.
 Albert J. Shochat, B.S., M.D., Instructor in Gastro-Enterology.
 Benedict Skitarelic, A.B., M.D., Instructor in Pathology†, and Assistant in Medicine.
 †Karl J. Steinmueller, A.B., M.D., Instructor in Surgery.

² Resigned July 31, 1946.

Harry A. Teitelbaum, B.S., M.D., Instructor in Gross Anatomy†, Assistant in Neurology.

David Tenner, M.D., Instructor in Medicine.

‡Dorsey R. Tipton, D.D.S., Instructor in Oral Surgery.

†William D. VandeGrift, M.D., Instructor in Pathology.

Philip S. Wagner, M.D., Instructor in Psychiatry.

Gibson J. Wells, A.B., M.D., Instructor in Pediatrics.

Hugh G. Whitehead, M.D., Instructor in Medicine.

*Milton J. Wilder, M.D., Instructor in Orthopaedic Surgery.

‡Henry L. Wollenweber, M.D., Instructor in Pathology.

†Israel Zeligman, A.B., M.D., Instructor in Dermatology.

ASSISTANTS

J. Warren Albrittain, B.S., M.D., Assistant in Obstetrics.

Leon Ashman, M.D., Assistant in Medicine.

‡John L. Atkins, A.B., M.D., Assistant in Medicine.

Jones B. Ballina, A.B., M.D., Assistant in Obstetrics.

Donald J. Barnett, M.D., Assistant in Roentgenology.

†Harry McB. Beck, M.D., Assistant in Gynecology.

Robert Z. Berry, A.B., M.D., Assistant in Surgery.

‡Joseph M. Blumberg, B.S., M.D., Assistant in Medicine.

†John Z. Bowers, B.S., M.D., Assistant in Medicine.

*Henry A. Briele, M.D., Assistant in Surgery.

A. V. Buchness, A.B., M.D., Assistant in Surgery.

Paul E. Carliner, B.S., M.D., Assistant in Medicine.

L. T. Chance, M.D., Assistant in Surgery.

‡William S. Cheney, M.D., Assistant in Surgery.

Robert F. Chenowith, M.D., Assistant in Surgery.

‡Robert C. Crawford, A.B., M.D., Assistant in Medicine.

Samuel H. Culver, M.D., Assistant in Surgery.

‡Raymond M. Cunningham, A.B., M.D., Assistant in Surgery.

Preston R. Cutler, A.B., M.D., Assistant in Surgery.

‡Daniel I. Dann, M.D., Assistant in Obstetrics.

†Edwin O. Daue, Jr., B.S., M.D., Assistant in Surgery.

*Nachman Davidson, A.B., M.D., Assistant in Medicine.

E. Hollister Davis, A.B., M.D., Assistant in Anaesthesia.

*George H. Davis, M.D., Assistant in Obstetrics.

John R. Davis, M.D., Assistant in Medicine.

†William A. Dodd, M.D., Assistant in Gynecology.

Charles H. Doeller, Jr., A.B., M.D., Assistant in Obstetrics and Gynecology.

‡H. C. Donahoo, Jr., M.D., Assistant in Obstetrics.

†William C. Duffy, A.B., M.D., Assistant in Gynecology.

†William C. Dunnigan, A.B., M.D., Assistant in Surgery.

Morris A. Fine, M.D., Assistant in Medicine and Genito-Urinary Surgery.

Herbert M. Foster, M.D., Assistant in Surgery.

Audrey M. Funk, A.B., Assistant in Medicine.

‡L. Calvin Gareis, B.S., M.D., Assistant in Obstetrics.

*Jason H. Gaskel, M.D., Assistant in Orthopaedic Surgery.

William R. Geraghty, B.S., M.D., Assistant in Surgery.

‡Walter H. Gerwig, Jr., M.D., Assistant in Surgery.

*Robert L. Gibbs, A.B., M.D., Assistant in Medicine.

‡Marion H. Gillis, M.D., Assistant in Ophthalmology.
 Robert J. Gore, M.D., Assistant in Pediatrics.
 H. L. Granoff, A.B., M.D., Assistant in Gynecology.
 William H. Grenzer, M.D., Assistant in Medicine.
 Joseph B. Gross, B.S., M.D., Assistant in Medicine.
 *Samuel J. Hankin, M.D., Assistant in Medicine.
 Oscar Hartman, B.S., M.D., Assistant in Obstetrics.
 John S. Haught, M.D., Assistant in Gynecology.
 *Thomas A. Hedrick, M.D., Assistant in Pediatrics.
 L. Ann Hellen, B.S., Assistant in Medicine.
 James W. Hendrick, M.D., Assistant in Surgery.
 John H. Hirschfeld, M.D., Assistant in Rhinology and Laryngology.
 John V. Hopkins, M.D., Assistant in Orthopaedic Surgery.
 †Rollin C. Hudson, M.D., Assistant in Medicine.
 Jaroslav Hulla, M.D., Assistant in Obstetrics.
 William C. Humphries, M.D., Assistant in Rhinology and Laryngology.
 †Benjamin H. Isaacs, A.B., M.D., Assistant in Rhinology and Laryngology.
 †Oliver A. James, M.D., Assistant in Surgery
 Jacob R. Jensen, B.S., M.D., Assistant in Obstetrics.
 Hugh Jewett, M.D., Assistant in Genito-Urinary Surgery.
 †Ferd E. Kadan, A.B., M.D., Assistant in Obstetrics.
 William H. Kammer, Jr., A.B., M.D., Assistant in Medicine.
 †Harry F. Kane, M.D., Assistant in Gynecology.
 Melvin D. Kappelman, B.S., M.D., Assistant in Obstetrics.
 Arthur Karfgin, B.S., M.D., Assistant in Medicine.
 James R. Karns, B.S., M.D., Assistant in Medicine.
 Lawrence Katzenstein, M.D., Assistant in Medicine.
 Lauriston L. Keown, A.B., M.D., Assistant in Pediatrics.
 †Irvin P. Klemkowski, M.D., Assistant in Obstetrics.
 *Charles W. Knerler, M.D., Assistant in Medicine.
 *Schuyler G. Kohn, B.S., M.D., Assistant in Obstetrics.
 Louis J. Kroll, A.B., M.D., Assistant in Medicine.
 Alfred S. Lederman, Assistant in Gastro-Enterology.
 †V. Harwood Link, A.B., M.D., Assistant in Dermatology.
 *F. Ford Loker, B.S., M.D., Assistant in Surgery.
 †William B. Long, Jr., B.S., M.D., Assistant in Surgery.
 †William C. Lowe, B.S., M.D., Assistant in Medicine.
 H. Pearce Maccubbin, B.S., M.D., Assistant in Medicine.
 John W. Machen, M.D., Assistant in Neurology.
 †Ernest W. Mack, M.D., Assistant in Surgery.
 Helen I. Maginnis, M.D., Assistant in Gynecology.
 W. Kenneth Mansfield, Jr., M.D., Assistant in Obstetrics.
 †Charles B. Marek, M.D., Assistant in Gynecology.
 A. Robert Marks, A.B., M.D., Assistant in Pediatrics.
 Maxwell L. Mazer, M.D., Assistant in Obstetrics.
 Robert B. Mearns, M.D., Assistant in Medicine.
 †Karl F. Mech, B.S., M.D., Assistant in Pathology.
 George C. Medairy, M.D., Assistant in Neurology.
 Israel P. Meranski, B.S., M.D., Assistant in Pediatrics.
 William A. Mitchell, M.D., Assistant in Obstetrics.
 John H. Morrison, B.S., M.D., Assistant in Obstetrics.

- S. Edwin Muller, M.D., Assistant in Medicine.
 Joseph E. Muse, Jr., B.S., M.D., Assistant in Medicine.
 Howard B. McElwain, M.D., Assistant in Surgery.
 †William W. McKinney, M.D., Assistant in Neurological Surgery.
 ‡Samuel McLanahan, Jr., A.B., M.D., Assistant in Surgery.
 §J. Edward Norris, M.D., Assistant in Obstetrics.
 †Richard S. Owens, M.D., Assistant in Otology.
 Margaret Virginia Palmer, A.M., M.D., Assistant in Medicine.
 Patrick C. Phelan, Jr., A.B., M.D., Assistant in Surgery.
 Leslie Harrell Pierce, B.S., M.D., Assistant in Medicine.
 †Ross Z. Pierpont, M.D., Assistant in Surgery and Surgical Anatomy.
 ‡Samuel E. Proctor, A.B., M.D., Assistant in Surgery.
 *J. Emmett Queen, A.B., M.D., Assistant in Medicine.
 †Frederick M. Reese, A.B., M.D., Assistant in Ophthalmology.
 †Samuel T. R. Revell, B.S., M.D., Assistant in Medicine.
 Henry L. Rigdon, M.D., Assistant in Surgery.
 †John O. Robben, B.S., M.D., Assistant in Plastic Surgery.
 †Donald J. Roop, M.D., Assistant in Medicine.
 †Seymour W. Rubin, M.D., Assistant in Pathology.
 †T. Edgie Russell, Jr., B.S., M.D., Assistant in Obstetrics.
 †William J. Rysanek, Jr., M.D., Assistant in Gynecology.
 Clarence P. Scarborough, M.D., Assistant in Plastic Surgery.
 W. J. Schmitz, M.D., Assistant in Pediatrics.
 Earle S. Scott, M.D., Assistant in Pediatrics.
 J. King B. E. Seegar, Jr., A.B., M.D., Assistant in Obstetrics.
 †Joseph C. Sheehan, B.S., M.D., Assistant in Gynecology.
 E. Roderick Shipley, A.B., M.D., Assistant in Surgery.
 George Silverton, A.B., M.D., Assistant in Medicine.
 Jerome Snyder, B.S., M.D., Assistant in Ophthalmology.
 †June Linda Snyder, A.B., Assistant in Physiology.
 Samuel Snyder, M.D., Assistant in Medicine.
 ‡Solomon Tanenbaum, M.D., Assistant in Dermatology.
 T. J. Touhey, M.D., Assistant in Surgery.
 Wilfred H. Townshend, Jr., A.B., M.D., Assistant in Medicine.
 W. H. Triplett, M.D., Assistant in Medicine.
 †Hugh H. Trout, Jr., M.D., Assistant in Surgery.
 †Robert B. Tunney, A.B., M.D., Assistant in Gynecology.
 ‡Frederick W. Waknitz, M.D., Assistant in Surgery.
 William K. Waller, A.B., M.D., Assistant in Medicine.
 William Earl Weeks, M.D., Assistant in Pediatrics.
 J. Carlton Wich, B.S., M.D., Assistant in Pediatrics.
 Albert R. Wilkerson, M.D., Assistant in Surgery.
 Daniel Wilfson, Jr., A.B., M.D., Assistant in Medicine.
 †Howard L. Zupnik, M.D., Assistant in Surgery.

FELLOWS

- ¹David Auld, Emerson Fellow in Pharmacology.
 Frederick K. Bell, Ph.D., U. S. Pharmacopoeia Fellow.

§ Died December 7, 1945.

¹ April 1, 1946 to August 31, 1946.

- †Roland E. Bieren, M.D., Hitchcock Fellow in Gynecology.
‡deCamp B. Farson, A.B., Elder Fellow in Pharmacology.
†Elaine Gaby, A.B., Emerson Fellow in Pharmacology.
†Ernest G. Guy, B.S., M.D., Weaver Fellow in Pathology.
‡Alvin H. Honigman, B.S., M.D., Weaver Fellow in Pathology.
‡Helen A. Horn, A.B., M.D., Weaver Fellow in Pathology
‡Harry K. Iwamoto, Ph.D., Emerson Fellow in Pharmacology.
†Louis O. J. Manganiello, A.B., M.D., Fellow in Neurological Surgery.
‡Sylvia L. Pollack, B.S., Weaver Fellow in Physiology.
†John O. Rohben, B.S., M.D., National Cancer Institute Fellow.
†Mary J. Sauerwald, A.B., Emerson Fellow in Pharmacology.
Dorothy K. Shipley, M.S., Fellow in Pharmacology.
‡Wilfred H. Townshend, Jr., A.B., M.D., Hitchcock Fellow in Medicine.
John A. Wagner, B.S., M.D., Hitchcock Fellow in Neurological Surgery.

UNIVERSITY HOSPITAL

EXECUTIVE COMMITTEE OF THE STAFF

H. BOYD WYLIE, *Acting Dean*,
 HAROLD A. SAYLES, *Acting Superintendent*, } *Ex officio*

Alternates

BEVERLY C. COMPTON, *Chairman*
 W. HOUSTON TOULSON, *Vice Chairman*
 MAURICE C. PINCOFFS
 ARTHUR M. SHIPLEY
 LOUIS H. DOUGLASS
 J. MASON HUNDLEY, JR.
 CLYDE A. CLAPP
 EDWARD A. LOOPER
 WALTER L. KILBY
 C. LORING JOSLIN
 ALLEN FISKE VOSHELL
 FREDERICK C. DYE
 HUGH R. SPENCER
 WILLIAM M. SEABOLD, *Secretary*

THOMAS P. SPRUNT
 CHARLES REID EDWARDS
 J. G. M. REESE
 HENRY F. GRAFF
 THOMAS R. O'ROURK
 CHARLES N. DAVIDSON
 J. EDMUND BRADLEY

UNIVERSITY HOSPITAL STAFF

HAROLD A. SAYLES, *Acting Superintendent*

<i>Physician-in-Chief</i>	MAURICE C. PINCOFFS
	{ WALTER A. BAETJER
	{ THOMAS P. SPRUNT
	{ JOHN E. LEGGE
<i>Physicians</i>	{ LOUIS A. M. KRAUSE
	{ G. CARROLL LOCKARD
	{ JOSEPH E. GICHNER
	{ WILLIAM H. SMITH
	{ WILLIAM S. LOVE, JR.
	{ T. NELSON CAREY
<i>Gastro-Enterologist</i>	ZACHARIAH R. MORGAN
<i>Neurologists</i>	{ IRVING J. SPEAR
	{ LEON FREEDOM
<i>Psychiatrists</i>	{ ROSS MCC. CHAPMAN
	{ RALPH P. TRUITT
	{ HARRY M. MURDOCK
	{ C. LORING JOSLIN
	{ ALBERT JAFFE
<i>Pediatricians</i>	{ J. EDMUND BRADLEY
	{ A. H. FINKELSTEIN
	{ WILLIAM M. SEABOLD
<i>Pathologist</i>	HUGH R. SPENCER
<i>Surgeon-in-Chief</i>	ARTHUR M. SHIPLEY

<i>Surgeons</i>	{ CHARLES REID EDWARDS †PAGE EDMUNDS THOMAS B. AYCOCK
<i>Neurological Surgeons</i>	{ CHARLES BAGLEY, JR. RICHARD G. COBLENTZ JAMES G. ARNOLD, JR.
<i>Laryngologists</i>	{ EDWARD A. LOOPER FRANKLIN B. ANDERSON THOMAS R. O'ROURK
<i>Proctologists</i>	{ MONTE EDWARDS THURSTON R. ADAMS
<i>Orthopaedic Surgeons</i>	{ ALLEN FISKE VOSHELL MOSES GELLMAN COMPTON RIELY HENRY F. ULLRICH
<i>Genito-Urinary Surgeons</i>	{ W. HOUSTON TOULSON W. A. H. COUNCILL LYLE J. MILLAN †HARRY S. SHELLEY HOWARD B. MAYS
<i>Dental Surgeon-in-Chief</i>	BRICE M. DORSEY
<i>Dentists</i>	{ VERNON D. KAUFMAN SAMUEL H. BRYANT †EDWARD C. DOBBS †CARL E. BAILEY †EUGENE L. PESSAGNO
<i>Röntgenologists</i>	{ WALTER L. KILBY CHARLES N. DAVIDSON DONALD J. BARNETT
<i>Dermatologist</i>	HARRY M. ROBINSON, SR.
<i>Bronchoscopist</i>	EDWARD A. LOOPER
<i>Otologist</i>	THOMAS R. O'ROURK
<i>Anaesthesiologist</i>	†FREDERICK C. DYE
<i>Obstetricians</i>	{ LOUIS H. DOUGLASS †M. A. NOVEY ISADORE A. SIEGEL J. G. M. REESE JOHN E. SAVAGE HUGH B. MCNALLY
<i>Ophthalmologists</i>	{ CLYDE A. CLAPP HENRY F. GRAFF F. EDWIN KNOWLES, JR. J. MASON HUNDLEY, JR. LEO BRADY BEVERLEY C. COMPTON
<i>Gynecologists</i>	{ J. MASON HUNDLEY, JR. LEO BRADY BEVERLEY C. COMPTON
<i>Oncologists</i>	{ J. MASON HUNDLEY, JR. GRANT E. WARD

ANNUAL HOSPITAL APPOINTMENTS

The following annual appointments are made to the University Hospital:

Three Residents in Medicine
Seven Residents in Surgery
One Resident in Neurosurgery
Three Residents in Gynecology

Four Residents in Obstetrics
Two Residents in Pediatrics
Two Residents in Roentgenology
Twenty-Four Rotating Interns

UNIVERSITY HOSPITAL RESIDENT AND INTERN STAFF

RESIDENT STAFF

APRIL 1, 1946 TO JUNE 30, 1946

FRANK J. AYD, JR., A.B., M.D., *Assistant Resident in Pediatrics*
LESTER H. CAPLAN, A.B., M.D., *Assistant Resident in Pediatrics*
MARY CLARK, A.B., M.D., *Assistant Resident in Medicine*
EDWIN O. DAUE, JR., B.S., M.D., *Assistant Resident in Surgery*
JOHN E. ESNARD, M.D., *Assistant Resident in Surgery*
JOHN F. GAYLE, M.D., *Assistant Resident in Gynecology*
JAMES H. GRAVES, B.S., M.B., M.D., *Assistant Resident in Obstetrics*
JAMES W. HENDRICK, B.S., M.D., *Assistant Resident in Surgery*
ALVIN H. HONIGMAN, B.S., M.D., *Resident in Medicine*
JAMES S. HUNTER, M.D., *Resident in Gynecology*
CHARLES H. INGRAM, A.B., M.D., *Assistant Resident in Surgery*
C. LOUIS JORGENSEN, A.B., M.D., *Resident in Obstetrics*
BERT A. KANWIT, A.B., M.D., *Assistant Resident in Surgery*
JAMES R. KARNS, B.S., M.D., *Assistant Resident in Medicine*
LORMAN L. LEVINSON, A.B., M.D., *Assistant Resident in Obstetrics*
CLARENCE MARTIN, M.D., *Assistant Resident in Obstetrics*
WILLIAM S. MILLER, A.B., M.D., *Assistant Resident in Obstetrics*
WILLIAM T. RABY, B.S., M.D., *Assistant Resident in Medicine*
JOHN O. ROBBEN, B.S., M.D., *Assistant Resident in Surgery*
EDWIN L. SEIGMAN, A.B., M.D., *Assistant Resident in Roentgenology*
E. RODERICK SHIPLEY, A.B., M.D., *Resident in Surgery*
EDWIN H. STEWART, JR., M.D., *Assistant Resident in Surgery*
ROBERT L. STONE, A.B., M.D., *Assistant Resident in Gynecology*
HUGH D. VAZZANA, M.D., *Assistant Resident in Roentgenology*
JAMES H. WALKER, A.B., M.D., *Assistant Resident in Surgery*

JULY 1, 1946 TO JUNE 30, 1947

FRANK J. AYD, JR., A.B., M.D., *Assistant Resident in Pediatrics*
WILLIAM L. BYERLY, B.S., M.D., *Assistant Resident in Surgery*
LESTER H. CAPLAN, A.B., M.D., *Assistant Resident in Pediatrics*
MARY CLARK, A.B., M.D., *Assistant Resident in Medicine*
EDWIN O. DAUE, JR., B.S., M.D., *Assistant Resident in Surgery*
JOHN E. ESNARD, M.D., *Assistant Resident in Surgery*
J. S. FIFER, M.D., *Resident in Ophthalmology, Otology, Rhinology, and Laryngology*
JOHN F. GAYLE, M.D., *Assistant Resident in Gynecology*
JAMES H. GRAVES, B.S., M.B., M.D., *Assistant Resident in Obstetrics*
E. MILDRED GREGORY, M.D., *Assistant Resident in Surgery*

JAMES S. HUNTER, M.D., *Resident in Gynecology*
 CHARLES H. INGRAM, A.B., M.D., *Assistant Resident in Surgery*
 C. LOUIS JORGENSEN, A.B., M.D., *Resident in Obstetrics*
 BERT A. KANWIT, A.B. M.D., *Assistant Resident in Surgery*
 JAMES R. KARNS, B.S., M.D., *Assistant Resident in Medicine*
 LORMAN L. LEVINSON, A.B., M.D., *Assistant Resident in Obstetrics*
 H. PEARCE MACCUBIN, B.S., M.D., *Resident in Medicine*
 CLARENCE MARTIN, M.D., *Assistant Resident in Obstetrics*
 WILLIAM S. MILLER, A.B., M.D., *Assistant Resident in Obstetrics*
 ALFRED T. NELSON, M.D., *Assistant Resident in Surgery*
 WILLIAM T. RABY, B.S., M.D., *Assistant Resident in Medicine*
 EDWIN L. SEIGMAN, A.B., M.D., *Assistant Resident in Roentgenology*
 EDWIN H. STEWART, JR., M.D., *Resident in Surgery*
 ROBERT L. STONE, A.B., M.D., *Assistant Resident in Gynecology*
 RAYMOND K. THOMPSON, B.S., M.D., *Resident in Neurosurgery*
 HUGH D. VAZZANA, M.D., *Resident in Roentgenology*
 JAMES H. WALKER, A.B., M.D., *Assistant Resident in Surgery*

INTERNS

April 1, 1946 to June 30, 1947

ROBERT E. BAUER, A.B., M.D.	CLARENCE W. LEGERTON, JR., M.D.
RICHARD J. CROSS, JR., B.S., M.D.	CHARLES B. MARSHALL, JR., M.D.
WALTER L. CROUCH, B.S., M.D.	GERALD A. MARTIN, B.S., M.D.
GUY K. DRIGGS, M.D.	GEORGE Y. MASSENBERG, M.D.
JAMES L. EAVEY, B.S., M.D.	ROBERT E. MCCURDY, B.S., M.D.
JOSEPH S. FISCHER, A.B., M.D.	JOHN E. MORRISON, M.D.
JOHN G. GREGG, A.B., M.D.	POMEROY NICHOLS, JR., M.D.
JOHN B. HARLEY, B.S., M.D.	MILTON REISCH, B.S., M.D.
CHARLES W. HAWKINS, M.D.	ROBERT C. ROSSBERG, B.S., M.D.
HARRY E. HILL, B.S., M.D.	FRANK A. SHALLENBERGER, JR., B.S., M.D.
CHARLES R. HOLMES, B.S., M.D.	JAMES A. VAUGHN, JR., A.B., M.D.
ERWIN R. JENNINGS, A.B., M.D.	JOSEPH R. WORKMAN, A.B., M.D.

DENTAL INTERN

HAROLD D. MOSES, A.B., D.D.S.

UNIVERSITY HOSPITAL DISPENSARY STAFF

EMMA WINSHIP, R.N.

Dispensary Director

DISPENSARY COMMITTEE

GEORGE H. YEAGER, *Chairman*

EMMA WINSHIP, R.N., *Secretary*

ALLEN FISKE VOSHELL
 BEVERLEY C. COMPTON
 A. H. FINKELSTEIN

LEWIS P. GUNDRY
 HOWARD B. MAYS
 D. FRANK KALTREIDER

¹*Chief of Medical Clinic.*

¹ To be appointed.

<i>Assistant Chiefs of Medical Clinic</i>	{ LEWIS P. GUNDRY IRVING FREEMAN KURT LEVY SAMUEL LEGUM
<i>Physicians</i>	{ M. A. FINE CHARLES R. GOLDSBOROUGH MEYER W. JACOBSON M. PAUL BYERLY SAMUEL J. HANKIN H. EDMUND LEVIN THOMAS P. SPRUNT G. CARROLL LOCKARD MILTON S. SACKS LESLIE HARRELL PIERCE
<i>Chief of Gastro-Enterology Clinic</i>	ZACHARIAH MORGAN
<i>Assistant Chiefs of Gastro-Enterology Clinic</i>	{ FRANCIS G. DICKEY Z. VANCE HOOPER
<i>Assistant Gastro-Enterologists</i>	{ SAMUEL MORRISON ALBERT J. SHOCHAT CHARLES V. SEVCIK ALFRED S. LEDERMAN
<i>Chief of Neurology Clinic</i>	LEON FREEDOM
<i>Assistant Neurologists</i>	{ WILLIAM L. FEARING HARRY A. TEITELBAUM
<i>Chief of Psychiatric Clinic</i>	RALPH P. TRUITT
<i>Assistant Psychiatrists</i>	{ H. W. NEWELL HARRY GOLDSMITH ALICE J. ROCKWELL JOSEPH MARSHALL H. ROBERT BLANK HANS W. LOEWALD SIDNEY BERMAN MABEL WILKINS KATHRYN L. SCHULTZ †HELEN ARTHUR †HAROLD L. VYNER
<i>Chief of Chest Clinic</i>	E. H. TONOLLA
<i>Assistants, Diseases of the Lungs</i>	{ MANUEL LEVIN MEYER W. JACOBSON JOSEPH E. MUSE, JR.
<i>Chief of Metabolism Clinic</i>	LEWIS P. GUNDRY
<i>Assistants in Metabolism Clinic</i>	{ WILLIAM G. HELFRICH WALTER E. KARFGIN A. GOLDMAN LOUIS V. BLUM W. GRAFTON HERSPERGER
<i>Chief of Cardiovascular Clinic</i>	WILLIAM S. LOVE, JR.

<i>Assistant Chiefs of Cardiovascular Clinic</i>	{ C. EDWARD LEACH ★ROBERT B. MITCHELL, JR
	{ SAMUEL J. HANKIN IRVING FREEMAN HARRY M. ROBINSON, JR. EPHRAIM T. LISANSKY F. FREDERICK RUZICKA H. F. ERMSHAR WILFRED H. TOWNSHEND †WILLIAM G. HELFRICH †ROLLIN C. HUDSON
<i>Assistant Cardiologists</i>	
<i>Chief of Allergy Clinic</i>	H. M. BUBERT
<i>Assistant Chief of Allergy Clinic</i>	EDWARD S. KALLINS
<i>Assistant Allergists</i>	{ SAMUEL SNYDER FRANK V. MANIERI S. EDWIN MULLER
<i>Allergy Clinic Technician</i>	SELMA ROSENBERG
<i>Director, Pediatric Clinic</i>	A. H. FINKELSTEIN
<i>Chief of Pediatric Clinic</i>	SAMUEL S. GLICK
	{ M. PAUL BYERLY ISRAEL P. MERANSKI WILLIAM M. SEABOLD JEROME FINEMAN ALBERT JAFFE LAURISTON L. KEOWN JOSEPH R. MEYEROWITZ GIBSON J. WELLS †ROBERT J. GORE LOUIS V. BLUM ★EARLE S. SCOTT ARNOLD F. LAVENSTEIN ★WILLIAM E. WEEKS ★THOMAS A. HEDRICK ★J. CARLTON WICH ★A. ROBERT MARKS
<i>Assistant Pediatricians</i>	
<i>Chief of Surgical Clinic</i>	GEORGE H. YEAGER
	{ †THURSTON R. ADAMS †LUTHER E. LITTLE ★GEORGE H. BROUILLET †STUART G. COUGHLAN †W. R. JOHNSON †SAMUEL E. PROCTOR †CLARENCE P. SCARBOROUGH WILLIAM B. SETTLE
<i>Assistant Surgeons</i>	
<i>Chief of Orthopaedic Surgery Clinic</i>	ALLEN FISKE VOSHELL

	{ JOHN V. HOPKINS MOSES GELLMAN HENRY F. ULLRICH
<i>Assistant Orthopaedic Surgeons</i>	{ †GEORGE S. APPLEBY MILTON J. WILDER †EVERETT D. JONES
<i>Chief of Genito-Urinary Clinic</i>	W. HOUSTON TOULSON
	{ W. A. H. COUNCILL JOHN F. HOGAN
<i>Assistant Genito-Urinary Surgeons</i>	{ LYLE J. MILLAN †HARRY S. SHELLEY HOWARD B. MAYS
<i>Director of Dermatology Clinic</i>	HARRY M. ROBINSON, SR.
<i>Chief of Dermatology Clinic</i>	HARRY M. ROBINSON, JR.
	{ †FRANCIS A. ELLIS †EUGENE S. BERESTON †A. ALBERT SHAPIRO
<i>Assistant Dermatologists</i>	{ LESTER N. KOLMAN MARK B. HOLLANDER BENJAMIN HIGHSTEIN †SOLOMON TANENBAUM †LUCILE CALDWELL †V. HARWOOD LINK
<i>Chief of Rhinology and Laryngology Clinic</i>	BENJAMIN S. RICH
	{ †CLEO D. STILES THOMAS R. O'ROURK
<i>Assistant Rhinologists and Laryngologists</i>	{ M. BAYLUS FREDERICK T. KYPER SAMUEL L. FOX
<i>Chief of Proctology Clinic</i>	MONTE EDWARDS
<i>Assistant Proctologist</i>	THURSTON R. ADAMS
<i>Chief of Gynecology Clinic</i>	J. MASON HUNDLEY, JR.
<i>Assistant Chief of Gynecology Clinic</i>	BEVERLEY C. COMPTON
	{ THOMAS S. BOWYER JOHN C. DUMLER JOHN T. HIBBITTS ERNEST I. CORNBROOKS, JR. WILLIAM B. SETTLE KENNETH B. BOYD
<i>Assistant Gynecologists</i>	{ W. ALLEN DECKERT EVERETT S. DIGGS HELEN I. MAGINNIS WILLIAM K. DIEHL ★JOHN S. HAUGHT †ERNEST I. CORNBROOKS, JR.

<i>Female Cystoscopists</i>	{ J. MASON HUNDLEY, JR. BEVERLEY C. COMPTON WILLIAM K. DIEHL
<i>Chief of Dental Clinic</i>	BRICE M. DORSEY
<i>Assistant Chief of Dental Clinic</i>	VERNON D. KAUFMAN
<i>Assistant Dentists</i>	{ †CARL E. BAILEY SAMUEL H. BRYANT †EDWARD C. DOBBS †EUGENE L. PESSAGNO
<i>Chief of Obstetrical Clinic</i>	*D. FRANK KALTREIDER
<i>Assistant Chief of Obstetrical Clinic</i>	*MARGARET B. BALLARD
<i>Assistant Obstetricians</i>	{ DUDLEY P. BOWE MAXWELL L. MAZER JAROSLAV HULLA ‡W. ALLEN DECKERT HUGH B. McNALLY †FERD E. KADAN JACOB R. JENSEN J. WARREN ALBRITAIN D. McCLELLAND DIXON W. KENNETH MANSFIELD, JR. †DANIEL I. DANN THOMAS S. BOWYER ‡L. CALVIN GAREIS OSCAR HARTMAN MELVIN D. KAPPELMAN JONES B. BALLINA WILLIAM A. MITCHELL †J. K. B. E. SEEGAR †T. EDGIE RUSSELL †IRVIN P. KLEMKOWSKI †KENNETH B. BOYD
<i>Oncology Clinic, Gynecological Division</i>	{ J. MASON HUNDLEY, JR. BEVERLEY C. COMPTON JOHN C. DUMLER WILLIAM K. DIEHL †ERNEST I. CORNBROOKS, JR. †EVERETT S. DIGGS
<i>Oncology Clinic, Surgical Division</i>	{ GRANT E. WARD E. EUGENE COVINGTON J. DUER MOORES †MURRAY M. COPELAND ARTHUR G. SIWINSKI †WILLIAM K. DIEHL

<i>Chief of Ophthalmology Clinic</i>	HENRY F. GRAFF
<i>Assistant Ophthalmologists</i>	FRANK A. HOLDEN MILTON C. LANG JEROME SNYDER †FREDERICK M. REESE
<i>Directress, Occupational Therapy</i>	MISS FRANCES F. LEWIS
<i>Directress, Social Service</i>	MISS MARY FITZPATRICK

UNIVERSITY HOSPITAL DISPENSARY REPORT

July 1, 1944-June 30, 1945

<i>Departments</i>	<i>New Cases</i>	<i>Old Cases</i>	<i>Total</i>
Allergy.....	113	2,148	2,261
Cardiology.....	113	1,436	1,549
Cystoscopy.....	88	424	512
Dermatology.....	3,496	8,417	11,913
Diabetic.....	43	634	677
Gastro-Intestinal.....	217	942	1,159
Genito-Urinary.....	293	593	886
Gynecology.....	1,358	4,198	5,556
Hematology.....	7	151	158
Medicine.....	1,078	2,915	3,993
Neurology.....	175	657	832
Obstetrics.....	1,456	10,508	11,964
Occupational Therapy.....	76	1,541	1,617
Oncology.....	150	989	1,139
Ophthalmology.....	1,054	3,264	4,318
Orthopaedic.....	1,111	2,239	3,350
Otology, Rhinology and Laryngology.....	969	1,013	1,982
Pediatrics.....	1,590	6,794	8,384
Physiotherapy.....	18	173	191
Plastic Surgery.....	15	34	49
Proctology.....	106	105	211
Psychiatry.....	124	259	383
Surgery.....	2,469	6,439	8,908
Tuberculosis.....	139	605	744
Total.....	16,258	56,478	72,736

MERCY HOSPITAL

BOARD OF GOVERNORS

WALTER D. WISE, *Chairman*

SISTER M. VERONICA
SISTER M. CELESTE
SISTER M. MILDRED
SISTER M. PHILIP
SISTER M. VINCENT
SISTER M. HELEN

HENRY F. BONGARDT
H. RAYMOND PETERS
MAURICE C. PINCOFFS
WAITMAN F. ZINN
THOMAS K. GALVIN
EDWARD P. SMITH
ELLIOTT H. HUTCHINS

MERCY HOSPITAL STAFF

<i>Surgeon-in-Chief</i>	WALTER D. WISE
	{ ELLIOTT H. HUTCHINS
	{ CHARLES F. BLAKE
	{ F. L. JENNINGS
	{ R. W. LOCHER
<i>Surgeons</i>	{ THOMAS R. CHAMBERS
	{ D. J. PESSAGNO
	{ WILLIAM F. RIENHOFF
	{ N. CLYDE MARVEL
	{ HENRY F. BONGARDT
<i>Neurological Surgeons</i>	{ CHARLES BAGLEY, JR.
	{ RICHARD B. COBLENTZ
	{ JAMES D. ARNOLD, JR.
	{ †FRANK J. OTENASEK
	{ I. O. RIDGELY
	{ JAMES W. NELSON
	{ HOWARD B. McELWAIN
	{ SIMON H. BRAGER
<i>Associate Surgeons</i>	{ JOHN A. O'CONNOR
	{ †THOMAS B. AYCOCK
	{ CHARLES W. MAXSON
	{ I. RIDGEWAY TRIMBLE
	{ RICHARD T. SHACKELFORD
	{ RAYMOND F. HELFRICH
	{ JULIUS GOODMAN
	{ †E. EUGENE COVINGTON
	{ S. DEMARCO, JR.
	{ T. J. TOUHEY
	{ WILLIAM N. McFAUL, JR.
	{ MEYER H. ZURAVIN
	{ HOWARD L. ZUPNIK
<i>Assistant Surgeons</i>	{ DANIEL R. ROBINSON
	{ JOSEPH V. JERARDI
	{ WM. C. DUNNIGAN
	{ HAROLD H. BURNS
	{ †WILLIAM L. GARLICK
	{ †JOHN F. SCHAEFER
	{ *F. FORD LOKER
	{ †PATRICK C. PHELAN

<i>Plastic Surgeon</i>	†EDWARD A. KITLOWSKI
<i>Consulting Ophthalmologist and Otologist</i>	HARRY FRIEDENWALD
<i>Ophthalmologists and Otologists</i>	{ H. K. FLECK M. RASKIN
<i>Associate Ophthalmologists and Otologists</i>	{ JOSEPH I. KEMLER F. A. PACIENZA
<i>Assistant Ophthalmologists and Otologists</i>	{ JOSEPH V. JEPPI †F. EDWIN KNOWLES, JR.
<i>Consulting Rhinologists and Laryngologists</i>	{ W. RAYMOND MCKENZIE GEORGE W. MITCHELL
<i>Rhinologist and Laryngologist</i>	WAITMAN F. ZINN
<i>Associate Rhinologists and Laryngologists</i>	{ FAYNE A. KAYSER BENJAMIN S. RICH THEODORE A. SCHWARTZ BIRKHEAD MACGOWAN †BENJAMIN H. ISAACS
<i>Assistant Rhinologist and Laryngologist</i>	JOSEPH V. JEPPI
<i>Bronchoscopist</i>	WAITMAN F. ZINN
<i>Associate Bronchoscopist</i>	FAYNE A. KAYSER
<i>Assistant Bronchoscopist</i>	THEODORE A. SCHWARTZ
<i>Proctologist</i>	CHARLES F. BLAKE
<i>Orthopaedic Surgeon</i>	H. L. ROGERS
<i>Associate Orthopaedic Surgeon</i>	HENRY F. ULLRICH
<i>Assistant Orthopaedic Surgeons</i>	{ I. H. MASERITZ ★J. H. GASKEL
<i>Urologist</i>	KENNETH D. LEGGE
<i>Associate Urologists</i>	{ LEON K. FARGO FRANCIS W. GILLIS
<i>Dermatologists</i>	{ FRANCIS A. ELLIS WILLIAM D. WOLFE †EUGENE S. BERESTON
<i>Dentist</i>	J. D. FUSCO
<i>Consulting Dentist</i>	†CONRAD L. INMAN
<i>Consulting Physician</i>	MAURICE C. PINCOFFS
<i>Physician-in-Chief</i>	H. RAYMOND PETERS
<i>Physicians</i>	{ †HARVEY G. BECK THOMAS P. SPRUNT GEORGE MCLEAN J. SHELDON EASTLAND LOUIS A. M. KRAUSE †THOMAS C. WOLFF

	{	HUBERT C. KNAPP
	{	BARTUS T. BAGGOTT
	{	WETHERBEE FORT
Associate Physicians	{	JOHN E. LEGGE
	{	T. NELSON CAREY
	{	SOL SMITH
	{	HUGH J. WELCH
	{	S. A. TUMMINELLO
	{	J. HOWARD BURNS
	{	EARL L. CHAMBERS
	{	K. W. GOLLEY
	{	WILLIAM H. KAMMER
Assistant Physicians	{	†DONALD J. ROOP
	{	S. EDWIN MULLER
	{	†WILLIAM C. LOWE
	{	JOHN R. DAVIS, JR.
	{	*J. EMMETT QUEEN
	{	†PHILIP D. FLYNN
	{	†FREDERICK J. VOLLMER
	{	T. FREDERICK LEITZ
Associate Gastro-Enterologists	{	THEODORE H. MORRISON
	{	*MAURICE FELDMAN
Assistant Gastro-Enterologist	{	†EPHRAIM T. LISANSKY
	{	EDGAR B. FRIEDENWALD
Pediatricians	{	FREDERICK B. SMITH
Associate Pediatrician	{	G. BOWERS MANSDORFER
	{	†WILLIAM J. SCHMITZ
	{	WILLIAM M. SEABOLD
Assistant Pediatricians	{	*JEROME FINEMAN
	{	†O. WALTER SPURRIER
	{	†ISRAEL P. MERANSKI
	{	†EDWARD L. FREY, JR.
Neurologist and Psychiatrist	{	ANDREW C. GILLIS
	{	HARRY GOLDSMITH
Associate Neurologists and Psychiatrists	{	PHILIP F. LERNER
Obstetrician-in-Chief	{	EDWARD P. SMITH
	{	J. J. ERWIN
	{	THOMAS K. GALVIN
Obstetricians	{	WILLIAM S. GARDNER
	{	FRANK K. MORRIS
	{	ERNEST S. EDLOW
	{	†HUGH B. McNALLY
Associate Obstetrician	{	CHARLES H. DOELLER, JR.

	{ J. HOWARD BURNS
	†HARRY F. KANE
	†WILLIAM A. DODD
<i>Assistant Obstetricians</i>	†HARRY MCB. BECK
	WILLIAM C. DUFFY
	JOSEPH C. SHEEHAN
	†WILLIAM J. RYSANEK, JR.
	ROBERT B. TUNNEY
<i>Consulting Gynecologist</i>	WILLIAM S. GARDNER
<i>Gynecologist-in-Chief</i>	THOMAS K. GALVIN
	{ EDWARD P. SMITH
<i>Gynecologists</i>	{ J. J. ERWIN
	{ *FRANK K. MORRIS
	{ ERNEST S. EDLOW
<i>Associate Gynecologists</i>	{ GEORGE A. STRAUSS, JR.
	{ *H. L. GRANOFF
	{ CHARLES H. DOELLER, JR.
	†WILLIAM A. DODD
	†HARRY MCB. BECK
<i>Assistant Gynecologists</i>	WILLIAM C. DUFFY
	JOSEPH C. SHEEHAN
	WILLIAM J. RYSANEK, JR.
	†HARRY F. KANE
	†ROBERT B. TUNNEY
	{ WALTER C. MERKEL
<i>Pathologists</i>	{ HUGH R. SPENCER
	{ †C. GARDNER WARNER
	{ H. T. COLLEBERG
<i>Clinical Pathologists</i>	{ †H. RAYMOND PETERS
	{ †CHARLES E. BRAMBLE
<i>Clinical Biochemist</i>	†CHARLES E. BRAMBEL
	{ SISTER PAULA MARIE
	ELEANOR BEHR
<i>Technicians</i>	{ CHARLOTTE SCHWALM
	{ LILLIAN MARIE LAWLER
	{ ELIZABETH JOHNSON
	{ CARMELA E. MICELI
<i>Consulting Radiologist</i>	ALBERTUS COTTON
<i>Radiologist</i>	†ASA D. YOUNG
<i>Assistant Radiologist</i>	E. EUGENE COVINGTON
	{ SISTER M. KEVIN
<i>Technicians</i>	{ CHARLOTTE CLOPETER
	{ HENRIETTA MCCAFFERY

ANNUAL HOSPITAL APPOINTMENTS

The following annual appointments are made to the Mercy Hospital:

Five Residents in Surgery	Resident in Pathology
Four Residents in Medicine	Resident in Rhinology
Three Residents in Gynecology and Obstetrics	
Twelve Interns on Rotating Service	

MERCY HOSPITAL RESIDENT AND INTERN STAFF

APRIL 1, 1946-JUNE 30, 1947

RESIDENT STAFF

KENNETH C. SHARRETTS, A.B., M.D., *Resident Surgeon*
 JESSE L. WILKINS, B.S., M.D., *Assistant Resident Surgeon*
 HAROLD P. BIEHL, A.B., M.D., *Assistant Resident Surgeon*
 MICHAEL DEVINCENTES, B.S., M.D., *Assistant Resident Surgeon*
 JAMES G. STEGMAIER, B.S., M.D., *Resident Pathologist*
 JOSEPH E. REAHL, A.B., M.D., *Assistant Resident Surgeon*
 EDWARD S. MCCABE, B.S., M.D., *Resident Physician*
 JOHN T. DOENGES, A.B., M.D., *Assistant Resident Physician*
 JAMES J. NOLAN, B.S., M.D., *Assistant Resident Physician*
 RICHARD A. CAREY, B.S., M.D., *Assistant Resident Physician*
 CHARLES STRAHAN, JR., B.S., M.D., *Assistant Resident Physician*
 ANTHONY F. STEDEM, JR., A.B., M.D., *Assistant Resident Physician*
 EDWARD H. HARDMAN, B.S., M.D., *Resident Gynecologist*
 DWIGHT P. CRUIKSHANK, A.B., M.D., *Associate Resident Gynecologist, Resident Obstetrician*
 HUGH B. MUNSON, M.D., *Assistant Resident Gynecologist and Obstetrician*
 JOSEPH M. DALY, M.D., *Resident Otolaryngologist*

RESIDENT INTERNES

WILLIAM D. GENTRY, JR., M.D.	JAMES V. MINOR, JR., A.B., M.D.
JAMES J. GERLACH, A.B., M.D.	THOMAS P. CONNOR, A.B., M.D.
AUGUST KIEL, JR., M.D.	JAMES S. O'HARE, B.S., M.D.
LAWRENCE J. KNOX, JR., B.S., M.D.	EARL R. PAUL, M.D.
THOMAS B. LEBHERZ, B.S., M.D.	JAMES A. ROBERTS, B.S., M.D.
CLARENCE E. MCWILLIAMS, JR., A.B., M.D.	DAVID N. SILLS, JR., M.D.
ROBERT E. MAY, A.B., M.D.	EDWARD P. SMITH, JR., M.D.

MERCY HOSPITAL DISPENSARY STAFF

SISTER M. AGNESINE, B.S., R.N. *Dispensary Director*
Supervisor of Surgical Clinic RAYMOND F. HELFRICH
Assistant Supervisor of Surgical Clinic HAROLD H. BURNS

	{	I. O. RIDGELY
		H. F. BONGARDT
		JAMES W. NELSON
		I. RIDGEWAY TRIMBLE
		SIMON H. BRAGER
		S. DEMARCO, JR.
		†E. EUGENE COVINGTON
		RICHARD T. SHACKELFORD
Assistant Surgeons	†	MEYER H. ZURAVIN
		HOWARD L. ZUPNIK
		DANIEL R. ROBINSON
		JOSEPH V. JERARDI
	†	WILLIAM C. DUNNIGAN
	†	WILLIAM L. GARLICK
	†	JOHN F. SCHAEFER
	*	†F. FORD LOKER
	†	PATRICK C. PHELAN
	†	RAYMOND J. LIPIN
Supervisor of Genito-Urinary Clinic		KENNETH D. LEGGE
Assistant Genito-Urinary Surgeons	{	L. K. FARGO
		FRANCIS W. GILLIS
Supervisor of Orthopaedic Clinic		ALBERTUS COTTON
Orthopaedic Surgeons	{	HARRY L. ROGERS
		HENRY F. ULLRICH
		I. H. MASERITZ
	*	†JASON H. GASKEL
Supervisors of Medical Clinic	{	H. RAYMOND PETERS
		MAURICE C. PINCOFFS
Chiefs of Medical Clinic	{	SOL SMITH
	*	†S. EDWIN MULLER
		MILTON STEIN
	†	LOUIS F. KLIMES
		IRVING FREEMAN
	†	PHILIP D. FLYNN
	†	FREDERICK J. VOLLMER
Assistant Physicians	†	WILLIAM H. KAMMER
	†	NATHANIEL M. BECK
	†	WILLIAM C. LOWE
		JOHN R. DAVIS
	*	†J. EMMETT QUEEN
	†	CHARLES F. O'DONNELL
	†	JOSEPH R. GUYTHER
Chief of Allergy Clinic		S. EDWIN MULLER
Chief of Cardiovascular Clinic		THOMAS C. WOLFF
Assistant Cardiologists	{	LEON ASHMAN
	†	EPHRAIM T. LISANSKY

<i>Chief of Metabolism Clinic</i>	J. SHELDON EASTLAND
<i>Assistant in Metabolism Clinic</i>	†LOUIS F. KLIMES
<i>Gastro-Enterologist</i>	MAURICE FELDMAN
<i>Assistant Gastro-Enterologist</i>	†EPHRAIM T. LISANSEY
<i>Chief of Pediatric Clinic</i>	EDGAR B. FRIEDENWALD
	{ G. BOWERS MANSDORFER
	{ JEROME FINEMAN
	{ GEORGE BAYLEY
<i>Pediatricians</i>	{ JOHN W. MACIEN
	{ †ISRAEL T. MERANSKI
	{ †O. WALTER SPURRIER
	{ †EDWARD L. FREY, JR.
<i>Supervisor of Neurological and Psychiatric Clinic</i>	ANDREW C. GILLIS
	{ HARRY GOLDSMITH
<i>Neurologists and Psychiatrists</i>	{ PHILIP F. LERNER
	{ GEORGE C. MEDAIRY
<i>Supervisor of Dermatology Clinic</i>	FRANCIS A. ELLIS
	{ WILLIAM D. WOLFE
<i>Dermatologists</i>	{ †EUGENE S. BERESTON
<i>Oncologist</i>	JAMES W. NELSON
<i>Chief of Gynecology Clinic</i>	THOMAS K. GALVIN
	{ EDWARD P. SMITH
	{ J. J. ERWIN
	{ FRANK K. MORRIS
	{ †GEORGE A. STRAUSS, JR.
	{ ERNEST S. EDLOW
	{ H. L. GRANOFF
<i>Gynecologists</i>	{ CHARLES H. DOELLER,
	{ JR.
	{ †WILLIAM A. DODD
	{ †HARRY MCB. BECK
	{ WILLIAM C. DUFFY
	{ JOSEPH C. SHEEHAN
	{ WILLIAM J. RYSANEK
	{ †HARRY F. KANE
	{ ROBERT B. TUNNEY
<i>Chief of Obstetrical Clinic</i>	EDWARD P. SMITH
	{ †HARRY F. KANE
	{ CHARLES H. DOELLER, JR.
	{ †J. HOWARD BURNS
<i>Obstetricians</i>	{ WILLIAM A. DODD
	{ HARRY MCB. BECK
	{ WILLIAM C. DUFFY
	{ †JOSEPH C. SHEEHAN
	{ †ROBERT B. TUNNEY

<i>Esophagoscopist</i>	WAITMAN F. ZINN
<i>Associate Esophagoscopist</i>	FAYNE A. KAYSER
<i>Rhinologists and Laryngologists</i>	{ WAITMAN F. ZINN
	‡ BENJAMIN S. RICH
	THEODORE A. SCHWARTZ
	‡ SAMUEL L. FOX
	‡ BENJAMIN H. ISAACS
<i>Ophthalmologists and Otolologists</i>	‡ ROSS C. BROOKS
	{ M. RASKIN
	F. A. PACIENZA
	JOSEPH V. JEPPI
<i>Supervisor of Proctology Clinic</i>	F. EDWIN KNOWLES, JR.
	CHARLES F. BLAKE
<i>Proctologists</i>	{ ‡ E. EUGENE COVINGTON
	SIMON H. BRAGER
<i>Supervisor of Dental Clinic</i>	J. D. FUSCO
<i>Consulting Dentist</i>	CONRAD L. INMAN
<i>Supervisor of Physiotherapy Clinic</i>	LEON HANNAN
<i>Assistant Physiotherapist</i>	ALICE R. HANNAN
<i>Social Worker</i>	SISTER M. HELEN
<i>Secretaries</i>	{ EVA APPLGARTH
	PEGGY O'NEILL

MERCY HOSPITAL DISPENSARY REPORT

Year of 1945

<i>Department</i>	<i>New Cases</i>	<i>Old Cases</i>	<i>Total</i>
Bronchoscopic	289	744	1,033
Cardiology	13	169	182
Dental	32	33	65
Dermatology	155	313	468
Diabetic	12	364	376
Gastro-Intestinal	20	103	123
Genito-Urinary	110	1,066	1,176
Gynecology	259	824	1,083
Medicine	400	1,992	2,392
Neurology	60	310	370
Ophthalmology	137	353	490
Orthopaedics	63	320	383
Pediatrics	239	716	955
Physiotherapy	118	2,167	2,285
Postnatal	378	221	599
Prenatal	280	1,984	2,264
Proctology	15	33	48
Rhinolaryngology	343	648	991
Surgery	717	3,373	4,090
Surgical Follow-Up	99	431	521
Well Baby Clinic	111	75	186
Totals	3,841	16,239	20,080

THE BALTIMORE CITY HOSPITALS

STAFF, 1946-1947

PARKER J. McMILLIN, *Superintendent*

<i>Consulting Chief Surgeon</i>	ARTHUR M. SHIPLEY, M.D., D.Sc.
<i>Surgeon-in-Chief</i>	THOMAS B. AYCOCK, B.S., M.D.
<i>Physician-in-Chief</i>	*JOHN T. KING, JR., A.B., M.D.
<i>Physician-in-Chief</i>	C. HOLMES BOYD, M.D.
<i>Physician-in-Chief, Radiology</i>	STANLEY H. MACHT, B.S., M.D.
<i>Physician-in-Chief, Tuberculosis Hospital</i>	*H. VERNON LANGELOTTIG, M.D.
<i>Physician-in-Chief, Tuberculosis Hospital</i>	LAWRENCE M. SERRA, M.D.
<i>Physician-in-Chief, Psychopathic Hospital</i>	ESTHER L. RICHARDS, M.D.
<i>Obstetrician-in-Chief</i>	LOUIS H. DOUGLASS, M.D.
<i>Pediatrician-in-Chief</i>	HAROLD E. HARRISON, B.S., M.D.
<i>Pathologist-in-Chief</i>	C. GARDNER WARNER, A.B., M.D.
<i>Dental Surgeon-in-Chief</i>	LOWELL P. HENNEBERGER, D.D.S.
<i>Assistant Surgeon-in-Chief</i>	OTTO C. BRANTIGAN, M.D.
<i>Visiting Surgeons</i>	{ JAMES C. OWINGS, M.D. HARRY C. HULL, M.D. HENRY N. HARKINS, M.D. F. C. LEE, M.D. I. RIDGEWAY TRIMBLE, M.D.
<i>Consultant in Traumatic Surgery</i>	CHARLES A. REIFSCHEIDER, M.D.
<i>Consultant in Peripheral Vascular Diseases</i>	GEORGE H. YEAGER, B.S., M.D.
<i>Consultants in Plastic Surgery</i>	{ EDWARD A. KITLOWSKI, M.D. EDWARD M. HANRAHAN, JR., M.D.
<i>Assistant Visiting Surgeons</i>	{ LUTHER E. LITTLE, M.D. GEORGE DUNCAN, M.D. HARRIS B. SCHUMACKER, JR., M.D.
<i>Assistant Chief Physician, Tuberculosis</i>	ALVIN S. HARTZ, M.D.
<i>Assistant Visiting Physicians, Tuberculosis</i>	{ JOHN H. HIRSCHFELD, M.D. LOUIS Z. DALMAU, M.D. EPHRAIM P. LISANSKY, M.D.
<i>Assistant Visiting Psychiatrist</i>	THOMAS A. C. RENNIE, M.D.
<i>Visiting Obstetrician</i>	J. G. M. REESE, M.D.
<i>Assistant Visiting Obstetricians</i>	{ JOHN M. HAWS, B.S., M.D. JOHN E. SAVAGE, B.S., M.D. HUGH B. McNALLY, B.S., M.D. J. WILLIAM DORMAN, A.B., M.D. D. FRANK KALTREIDER, A.B., M.D.
<i>Assistant Pediatrician-in-Chief</i>	JOHN E. BAYBUTT, M.D.

<i>Visiting Pediatricians</i>	{ *WILLIAM DORMAN, M.D. *WILLIAM B. STIFLER, M.D. *B. MATTHEW DEBUSKEY, M.D.
<i>Assistant Visiting Pediatrician</i>	WILLIAM M. SEABOLD, A.B., M.D.
<i>Visiting Gynecologist</i>	J. MASON HUNDLEY, JR., M.A., M.D.
<i>Assistant Visiting Gynecologists</i>	{ BEVERLEY COMPTON, M.D. JOHN C. DUMLERS, B.S., M.D. JOHN T. HIBBITTS, M.D. ERNEST I. CORNBROOKS, JR., M.D. WILLIAM K. DIEHL, M.D.
<i>Assistant Chief Physician</i>	HOWARD K. RATHBUN, M.D.
<i>Visiting Physicians</i>	{ *JOHN W. PARSONS, M.D. LOUIS A. M. KRAUSE, M.D. HARRY F. KLINEFELTER, JR., M.D. CHARLES C. W. JUDD, M.D.
<i>Assistant Visiting Physician</i>	THEURSTON HARRISON, M.D.
<i>Visiting Cardiologist</i>	
<i>Visiting Ophthalmologist</i>	FRANK B. WALSH, M.D.
<i>Visiting Orthopaedic Surgeons</i>	{ ALLEN F. VOSHELL, A.B., M.D. HENRY F. ULLRICH, M.D., D.Sc.
<i>Assistant Visiting Orthopaedic Surgeon</i>	MILTON J. WILDER, M.D.
<i>Visiting Laryngologists</i>	{ THOMAS R. O'ROURKE, M.D. JOHN E. BORDLEY, M.D.
<i>Assistant Visiting Laryngologists</i>	{ DONALD F. PROCTOR, M.D. FREDERICK T. KYPER, M.D.
<i>Visiting Urologist</i>	W. HOUSTON TOULSON, M.Sc., M.D.
<i>Assistant Visiting Urologists</i>	{ HUGH JEWETT, M.D. HOWARD B. MAYS, M.D.
<i>Visiting Neurological Surgeons</i>	{ CHARLES BAGLEY, JR., M.A., M.D. RICHARD G. COBLENTZ, M.A., M.D.
<i>Assistant Visiting Neurological Surgeon</i>	JAMES G. ARNOLD, JR., M.D.
<i>Visiting Neurologists</i>	{ FRANK R. FORD, M.D. O. R. LANGWORTHY, M.D.
<i>Assistant Visiting Neurologists</i>	{ HARRY A. TEITELBAUM, M.D. HAROLD L. VYNER, M.D. GEORGE G. MERRILL, M.D.
<i>Visiting Proctologist</i>	MONTE EDWARDS, M.D.
<i>Visiting Oncologist</i>	GRANT E. WARD, A.B., M.D.
<i>Assistant Visiting Otolologist</i>	J. J. BELEMER, M.D.
<i>Visiting Dermatologist</i>	ISAAC R. PELS, M.D.
<i>Visiting Dental Surgeon</i>	H. GLENN WARING, D.D.S.
<i>Assistant Visiting Dental Surgeon</i>	L. W. BIMESTEFER, D.D.S.
<i>Visiting Laboratory Physician</i>	JULIUS M. WAGHELSTEIN, M.D.
<i>Physiologist</i>	NATHAN SHOCK, M.D.
<i>Visiting Radiologist</i>	HOWARD H. ASHBURY, M.D.

THE JAMES LAWRENCE KERNAN HOSPITAL AND INDUSTRIAL SCHOOL OF MARYLAND FOR CRIPPLED CHILDREN

STAFF, 1946-1947

<i>Surgeon-in-Chief and Medical Director</i>	ALLEN FISKE VOSHELL, A.B., M.D.
<i>Attending Orthopaedic Surgeon and Roentgenologist</i>	ALBERTUS COTTON, A.M., M.D.
<i>Associate Orthopaedic Surgeons</i>	{ MOSES GELLMAN, B.S., M.D. HARRY ROGERS, M.D. WINTHROP M. PHELPS, A.B., M.D.
<i>Assistant Orthopaedic Surgeon</i>	MILTON J. WILDER, M.D.
<i>Plastic Surgeon</i>	EDWARD A. KITLOWSKI, A.B., M.D.
<i>Aurist and Laryngologist</i>	BENJAMIN S. RICH, A.B., M.D.
<i>Dentist</i>	M. E. COBERTH, D.D.S.
<i>Pediatrist</i>	HELEN M. TAUSSIG, M.D.
<i>Consulting Surgeons</i>	{ ARTHUR M. SHIPLEY, M.D., Sc.D. CHARLES REID EDWARDS, A.B., M.D. THOMAS B. AYCOCK, B.S., M.D.
<i>Consulting Aurists and Laryngologists</i>	{ FRANKLIN B. ANDERSON, M.D. EDWARD A. LOOPER, M.D., D.Oph.
<i>Consulting Neurological Surgeon</i>	CHARLES BAGLEY, JR., M.A., M.D.
<i>Consulting Plastic Surgeon</i>	JOHN STAIGE DAVIS, B.Sc., M.D.
<i>Consulting Physician</i>	THOMAS R. BROWN, A.B., M.D.
<i>Consulting Dermatologists</i>	{ HARRY M. ROBINSON, Sr., M.D. LEON GINSBERG, M.D.
<i>Consulting Neurologists</i>	{ IRVING J. SPEAR, M.D. R. V. SELIGER, M.D.
<i>Consulting Pediatrist</i>	BENJAMIN TAPPAN, A.B., M.D.
<i>Consulting Dentist</i>	HARRY B. MCCARTHY, D.D.S.
<i>Consulting Ophthalmologists</i>	{ HARRY FRIEDENWALD, A.B., M.D., D.H.L., D.Sc. WILLIAM TARUN, M.D.
<i>Consulting Pathologist</i>	HUGH R. SPENCER, M.D.
<i>Consulting Roentgenologist</i>	HENRY J. WALTON, M.D.
<i>Resident Orthopaedic Surgeon</i>	EVERETT D. JONES, M.D.
<i>Superintendent</i>	MISS MAUD M. GARDNER, R.N.
<i>Dispensary and Social Service Nurse</i>	MRS. EVELYN BYRD ZAPP, R.N.
<i>Physical Therapists and X-ray Technician</i>	{ MISS CARILINE EARLE, P.T., Reg. MRS. GEORGIANA WISONG
<i>Occupational Therapist</i>	MISS MURIEL ZIMMERMAN, O.T.
<i>Instructor in Grammar School</i>	MISS BERTHA SENDELBACK

HISTORY OF THE SCHOOL OF MEDICINE

The present School of Medicine, with the title University of Maryland School of Medicine and College of Physicians and Surgeons, is the result of a consolidation and merger of the University of Maryland School of Medicine with the Baltimore Medical College (1913) and the College of Physicians and Surgeons of Baltimore (1915).

Through the merger with the Baltimore Medical College, an institution of thirty-two years' growth, the facilities of the School of Medicine were enlarged in faculty, equipment and hospital connection.

The College of Physicians and Surgeons was incorporated in 1872, and established on Hanover Street in a building afterward known as the *Maternité*, the first obstetrical hospital in Maryland. In 1878 union was effected with the Washington University School of Medicine, in existence since 1827, and the college was removed to Calvert and Saratoga Streets. Through the consolidation with the College of Physicians and Surgeons, medical control of the teaching beds in the Mercy Hospital was obtained.

The School of Medicine of the University of Maryland is one of the oldest foundations for medical education in America, ranking fifth in point of age among the medical colleges of the United States. It was organized in 1807 and chartered in 1808 under the name of the College of Medicine of Maryland, and its first class was graduated in 1810. In 1812 the College was empowered by the Legislature to annex three other colleges or faculties: Divinity, Law, and Arts and Sciences; and the four colleges thus united were "constituted an University by the name and under the title of the University of Maryland."

The original building of the Medical School at the N. E. corner of Lombard and Greene Streets was erected in 1812. It is the oldest structure in this country from which the degree of doctor of medicine has been granted annually since its erection. In this building were founded one of the first medical libraries and one of the first medical school libraries in the United States.

At this Medical School dissection was made a compulsory part of the curriculum, and independent chairs for the teaching of gynecology and pediatrics (1867), and of ophthalmology and otology (1873), were installed for the first time in America.

This School of Medicine was one of the first to provide for adequate clinical instruction by the erection of its own hospital in 1823. In this hospital intramural residency for senior students was established for the first time.

BUILDINGS AND FACILITIES

The original medical building at the N. E. corner of Lombard and Greene Streets houses the Office of the Dean, Office of the Assistant Dean and two lecture halls.

The Administration Building, to the east of the original building, contains the Baltimore offices of the Registrar and the Director of Admissions and two lecture halls.

The laboratory building at 31 South Greene Street is occupied by the departments of Pathology, Bacteriology and Biochemistry.

The Frank C. Bressler Research Laboratory provides the departments of Anatomy, Histology and Embryology, Pharmacology, Physiology and Clinical Pathology with facilities for teaching and research. It also houses the research laboratories of the clinical departments, animal quarters, a laboratory for teaching Operative Surgery, a lecture hall and the Bressler Memorial Room.

This building was erected in 1939-1940 at 29 South Greene Street opposite the University Hospital. It was built with funds left to the School of Medicine by the late Frank C. Bressler, an alumnus, supplemented by a grant from the Federal government. The structure, in the shape of an I, extends east from Greene Street, just north of the original building.

MEDICAL LIBRARY

¹HOWARD ROVELSTAD, A.B., M.A., B.S.L.S. *Acting Director of Libraries*

²CARL W. HINTZ, A.B., A.B.L.S., A.M.L.S. *Director of Libraries*

IDA MARIAN ROBINSON, A.B., B.S.L.S. *Librarian*

³RUTH LEE BRISCOE *Assistant Librarian*

JULIA E. WILSON, B.S., B.S.L.S. *Assistant Librarian*

EDITH R. MCINTOSH, A.M., A.B.L.S. *Cataloguer*

CHARLOTTE JUBB *Assistant to the Cataloguer*

The Medical Library of the University of Maryland, founded in 1813 by the purchase of the collection of Dr. John Crawford, now numbers 26,000 volumes and several thousand pamphlets and reprints. Over three hundred of the leading medical journals, both foreign and domestic, are received regularly. The library is housed in Davidge Hall, a comfortable and commodious building in close proximity to classrooms and laboratories, and is open daily for the use of members of the faculty, the student body and the profession generally. Libraries pertaining to particular phases of medicine are maintained by several departments of the medical school.

The library of the Medical and Chirurgical Faculty of Maryland and the Welch Medical Library are open to students of the medical school without charge. Other libraries of Baltimore are the Peabody Library and the Enoch Pratt Free Library.

DISPENSARY BUILDING

The old hospital building has been remodeled and is occupied by the Out-patient Department. Thus the students have been provided with a splendidly appointed group of clinics for their training in out-patient work. All departments of clinical training are represented in this remodeled building and all changes have been predicated on the teaching function for which this department is intended.

The office of the Medical School Physician is located in this building.

The Department of Art also occupies quarters here.

¹ Appointed July 1, 1946.

² Resigned June 30, 1946.

³ Retired July 31, 1946.

UNIVERSITY HOSPITAL

The University Hospital, which is the property of the University of Maryland, is the oldest institution for the care of the sick in the state of Maryland. It was opened in September 1823, under the name of the Baltimore Infirmary, and at that time consisted of but four wards, one of which was reserved for patients with diseases of the eye.

In 1933-1934 the new University Hospital was erected and patients were admitted to this building in November 1934. The new hospital is situated at the southwest corner of Redwood and Greene Streets, and is consequently opposite the medical school buildings. The students, therefore, are in close proximity and little time is lost in passing from the lecture halls and laboratories to the clinical facilities of the new building.

This new building, with its modern planning, makes a particularly attractive teaching hospital and is a very valuable addition to the clinical facilities of the medical school.

The new hospital has a capacity of 435 beds and 65 bassinets devoted to general medicine, surgery, obstetrics, pediatrics, and the various medical and surgical specialties.

The teaching zone extends from the second to the eighth floor and comprises wards for surgery, medicine, obstetrics, pediatrics, and a large clinical lecture hall. There are approximately 270 beds available for teaching.

The space of the whole north wing of the second floor is occupied by the department of roentgenology. The east wing houses clinical pathology and special laboratories for clinical microscopy, biochemistry, bacteriology, and an especially well appointed laboratory for students' training. The south wing provides space for electro-cardiographic and basal metabolism departments, with new and very attractive air-conditioned or oxygen therapy cubicles. The west wing contains the departments of rhinolaryngology and bronchoscopy, industrial surgery, ophthalmology, and male and female cystoscopy.

The third and fourth floors each provide two medical and two surgical wards. The fifth floor contains two wards for pediatrics, and on the sixth floor there are two wards for obstetrics. Each ward occupies the space of one wing of the hospital.

On the seventh floor is the general operating suite, the delivery suite, and the central supply station. The eighth floor is essentially a students' floor and affords a mezzanine over the operating and delivery suites, and a students' entrance to the clinical lecture hall.

In the basement there is a very well appointed pathological department with a large teaching autopsy room and its adjunct service of instruction of students in pathological anatomy.

The hospital receives a large number of accident patients because of its proximity to the largest manufacturing and shipping districts of the city.

The obstetrical service is particularly well arranged and provides accommodation for forty ward patients. This service, combined with an extensive home service, assures the student abundant obstetrical training.

During the year ending December 31, 1945, 1917 cases were delivered in the hospital and 395 cases in the outdoor department. Students in the graduating class observed at least thirty-five cases, each student being required to deliver at least ten patients in their homes.

The dispensaries associated with the University Hospital and the Mercy Hospital are organized upon a uniform plan in order that the teaching may be the same in each. Each dispensary has the following departments: medicine, surgery, pediatrics, ophthalmology, otology, genito-urinary, gynecology, gastroenterology, neurology, orthopaedics, proctology, dermatology, laryngology, rhinology, cardiology, tuberculosis, psychiatry, oral surgery and oncology.

All students in their junior year work each day during one-third of the year in the departments of medicine and surgery of the dispensaries. In their senior year, all students work one hour each day in the special departments.

MERCY HOSPITAL

The Sisters of Mercy first assumed charge of the Hospital at the corner of Calvert and Saratoga Streets, then owned by the Washington University, in 1874. By the merger of 1878 the Hospital came under the control of the College of Physicians and Surgeons, but the Sisters continued their work of ministering to the patients.

In a very few years it became apparent that the City Hospital, as it was then called, was much too small to accommodate the rapidly growing demands upon it. However, it was not until 1888 that the Sisters of Mercy, with the assistance of the Faculty of the College of Physicians and Surgeons, were able to lay the cornerstone of the present hospital. This building was completed and occupied late in 1889. Since then the growing demands for more space have compelled the erection of additions, until now there are accommodations for 348 patients.

In 1909 the name was changed from The Baltimore City Hospital to Mercy Hospital.

The clinical material in the free wards is under the exclusive control of the Faculty of the University of Maryland School of Medicine and College of Physicians and Surgeons.

THE BALTIMORE CITY HOSPITALS

The clinical facilities of the School of Medicine have been largely increased by the liberal decision of the Department of Public Welfare to allow the use of the wards of these hospitals for medical education. The autopsy material also is available for student instruction.

Members of the junior class make daily visits to these hospitals for clinical instruction in medicine, surgery, and the specialties.

The Baltimore City Hospitals consist of the following separate divisions:

The General Hospital, 400 beds, 90 bassinets.

The Hospital for Chronic Cases, 575 beds.

The Hospital for Tuberculosis, 280 beds.

Infirmary (Home for Aged) 700 beds.

THE JAMES LAWRENCE KERNAN HOSPITAL AND INDUSTRIAL SCHOOL OF MARYLAND FOR CRIPPLED CHILDREN

This institution is situated on an estate of 75 acres at Dickeyville. The site is within the northwestern city limits and of easy access to the city proper.

The location is ideal for the treatment of children, in that it affords all the advantages of sunshine and country air.

A hospital unit, complete in every respect, offers all modern facilities for the care of any orthopaedic condition in children.

The hospital is equipped with 100 beds—endowed, and city and state supported.

The orthopaedic dispensary at the University Hospital is maintained in closest affiliation and cares for the cases discharged from the Kernan Hospital. The physical therapy department is very well equipped with modern apparatus and trained personnel. Occupational therapy has been fully established and developed under trained technicians.

THE BALTIMORE EYE, EAR, AND THROAT HOSPITAL

This institution was first organized and operated in 1882 as an outgrowth of the Baltimore Eye and Ear Dispensary, which closed on June 14, 1882. The name then given to the new hospital was The Baltimore Eye and Ear Charity Hospital. It was located at the address now known as 625 W. Franklin St. The out-patient department was opened on September 18, 1882 and the hospital proper on November 1 of the same year. In 1898 a new building afforded 24 free beds and 8 private rooms; by 1907 the beds numbered 47; at present there are 60 beds, 29 of which are free. In 1922 the present hospital building at 1214 Eutaw Place was secured and in 1926 the dispensary was opened. In 1928 a clinical laboratory was installed. During 1943 the out-patient visits numbered 18,989.

Through the kindness of the Hospital Board and Staff, our junior students have access to the dispensary which they visit in small groups for instruction in ophthalmology.

REQUIREMENTS FOR ADMISSION

METHOD OF MAKING APPLICATION

Application forms may be filed one calendar year before the next incoming class. These forms may be secured from the Committee on Admissions, School of Medicine, University of Maryland, Baltimore-1, Maryland.

APPLICATION FOR ADMISSION TO THE FIRST YEAR

Application for admission is made by filing the required form and by having all pertinent data sent directly to the Committee on Admissions, in accordance with the instructions accompanying the application.

APPLICATION FOR ADMISSION TO ADVANCED STANDING

Students who have attended approved medical schools are eligible to file applications for admission to the second- and third-year classes. These applicants must be prepared to meet the current first-year entrance requirements in addition to presenting acceptable medical school credentials, and a medical school record based on courses which are quantitatively and qualitatively equivalent to similar courses in this school.

Application to advanced standing is made in accordance with the instructions accompanying the application form.

MINIMUM REQUIREMENTS FOR ADMISSION

The minimum requirements for admission to the School of Medicine are:

- (a) Graduation from an approved secondary school, or the equivalent in entrance examinations, and
- (b) Three academic years of acceptable premedical credit earned in an approved college of arts and sciences. The quantity and quality of this preprofessional course of study shall be not less than that required for recommendation by the institution where the premedical courses are being, or have been, studied.

The premedical curriculum shall include basic courses in

English
Biology
Inorganic Chemistry
Organic Chemistry
Physics
French or German

and such elective courses as will complete a balanced three-year schedule of study. The elective courses should be selected from the following three groups:

<i>Humanities</i>	<i>Natural Sciences</i>	<i>Social Sciences</i>
English (an advanced course in English composition should be taken, if possible)	Vertebrate Embryology	Economics
Scientific German or French (A reading knowledge of either language is desirable, although German is preferred)	Comparative Vertebrate Anatomy	History
Philosophy	Quantitative Analysis	Political Science
	Physical Chemistry	Psychology (a basic course is desirable)
	Mathematics	Sociology, etc.

Careful attention should be given to the selection of elective courses in the natural sciences. Accordingly, it is suggested that the elective list given above be a guide in this connection and that the remainder of the college credits be accumulated from courses designed to promote a broad cultural development. Students should avoid the inclusion of college courses in subjects that occur in the medical curriculum, for example, histology, histological technique, human anatomy, bacteriology, physiology, neurology, physiological chemistry.

It is not intended that these suggestions be interpreted to restrict the education of students who exhibit an aptitude for the natural sciences or to limit the development of students who plan to follow research work in the field of medicine.

In accepting candidates for admission, preference will be given to those applicants who have acceptable scholastic records in secondary school and college, satisfactory scores in the Medical Aptitude Test, favorable letters of recommendation from their premedical committees, or from one instructor in each of the departments of biology, chemistry, and physics, and who in all other respects give every promise of becoming successful students and physicians of high standing.

Those candidates for admission who are unconditionally accepted will receive a certificate of matriculation from the Office of the Dean.

COMBINED COURSE IN ARTS AND SCIENCES AND MEDICINE

A combined seven years' curriculum leading to the degrees of Bachelor of Science and Doctor of Medicine is offered by the University of Maryland. The first three years are taken in residence in the College of Arts and Sciences at College Park, and the last four years in the School of Medicine in Baltimore. (See University catalogue for details of quantitative and qualitative premedical course requirements.)

If a candidate for the combined degree completes the work of the first year in the School of Medicine with an average of "C" or better, and if he has absolved

the quantitative and qualitative premedical requirements set up by the University, he is eligible to recommendation by the Dean of the School of Medicine that the degree of Bachelor of Science be conferred.

Because the general commencement at College Park usually takes place before the School of Medicine is prepared to release grades of the first-year class, this combined degree of Bachelor of Science is conferred at the commencement following the candidate's second year of residence in the School of Medicine.

STATE MEDICAL STUDENT QUALIFYING CERTIFICATES

Candidates for admission who live in or expect to practice medicine in Pennsylvania, New Jersey or New York, should apply to their respective state boards of education for medical student qualifying certificates (Pennsylvania and New Jersey) or approval of applications for medical student qualifying certificates (New York).

Those students who are accepted must file satisfactory State certificates in the office of the Committee on Admissions, School of Medicine, before registration. No exceptions will be made to this requirement.

Addresses of the State Certifying Offices

Director of Credentials Section, Pennsylvania Department of Public Instruction, Harrisburg, Pa.

Chief of the Bureau of Credentials, New Jersey Department of Public Instruction, Trenton, N. J.

Supervisor of Qualifying Certificates, The State Education Department, Examinations and Inspections Division, Albany, N. Y.

DEFINITION OF RESIDENCE STATUS OF STUDENTS*

Students who are minors are considered to be resident students if, at the time of their registration, the parents* have been residents of this State for at least one year.

Adult students are considered to be resident students if, at the time of their registration, they have been residents of this State for at least one year, provided such residence has not been acquired while attending any school or college in Maryland.

The status of the residence of a student is determined at the time of his first registration in the university and may not thereafter be changed by him unless, in the case of a minor, his parents* move to and become legal residents of this state by maintaining such residence for at least one full calendar year. However, the right of the student (minor) to change from a non-resident to a resident status must be established by him prior to registration for a semester in any academic year.

* The term "parents" includes persons who, by reason of death or other unusual circumstances, have been legally constituted the guardians of or stand in loco parentis to such minor students.

CURRENT FEES

Matriculation fee (paid once)	\$10.00
Tuition fee (each year)—Residents of Maryland	450.00
Tuition fee (each year)—Non-Residents	600.00
Laboratory fee (each year)	25.00
Student health service fee (each year)	20.00
Maintenance and service fee (each year)	10.00
Graduation fee	15.00
Re-examination fee (each subject)	5.00
Transcript fee to graduates. First copy gratis, each copy thereafter . .	1.00

RULES FOR PAYMENT OF FEES

No fees are returnable.

Make all checks or money orders payable to the University of Maryland.

When offering checks or money orders in payment of tuition and other fees, students are requested to have them drawn in the exact amount of such fees. Personal checks whose face value is in excess of the fees due will be accepted for collection only.

Acceptance.—Payment of the matriculation fee of \$10.00 and a deposit on tuition of \$50.00 is required of accepted applicants before the expiration date specified in the offer of acceptance. This \$60.00 deposit is not returnable and will be forfeited if the applicant fails to register, or it will be applied to the applicant's first semester's charges on registration.

Registration.—All students, after proper certification, are required to register at the Office of the Comptroller, Gray Laboratory. (See calendar in front of this bulletin for dates for the payments of fees, and the note regarding late registration fee.)

One-half of the tuition fee, the laboratory fee, the student health fee, and the maintenance and service fee are payable on the date specified for registration for the first semester.

The remainder of the tuition fee shall be paid on the date designated for the payment of fees for the second semester. Fourth year students shall pay the graduation fee, in addition, at this time.

PENALTY FOR NON-PAYMENT OF FEES

If semester fees are not paid in full on the specified registration dates, a penalty of \$5.00 will be added.

If a satisfactory settlement, or an agreement for settlement, is not made with the Dean within ten days after a payment is due, the student automatically is debarred from attendance on classes and will forfeit the other privileges of the School of Medicine.

REEXAMINATION FEE

A student who is eligible to reexaminations must pay the comptroller \$5.00 for each subject in which he is to be examined, and he must present the receipt to the faculty member giving the examination before he will be permitted to take the examination.

MAINTENANCE AND SERVICE FEE

This fee pays for the use of clothing lockers, and provides for the maintenance of loan collections and of the student lounge and cafeteria. It also furnishes photographs for all departmental requests and for state board applications, pays room rent for the third- and fourth-year students when on outside obstetrics and furnishes the graduating students with invitations and tickets to the Pre-Commencement Exercises.

PERSONAL EXPENSES

The following estimates of personal expenses for the academic year of eight months have been prepared by students, and are based upon actual experience. In addition to these the student must bear in mind the expenditure for a microscope.

	<i>Low</i>	<i>Average</i>	<i>Liberal</i>
Books.....	\$50	\$75	\$100
College incidentals.....	20	20	20
Board, eight months.....	224	288	352
Room rent.....	144	184	216
Clothing and laundry.....	50	80	150
All other expenses.....	25	50	75
Total.....	<u>\$513</u>	<u>\$697</u>	<u>\$913</u>

STUDENT HEALTH SERVICE

T. NELSON CAREY, M.D.....Director, Student Health Service

The Medical School has made provision for the systematic care of students according to the following plan:

1. *Preliminary Examination*—All new students will be examined during the first week of the semester. Notice of the date, time, and place of the examination will be announced to the classes and on the bulletin board. The passing of this physical examination is necessary before final acceptance of any student.

2. *Medical Attention*—Students in need of medical attention will be seen by the school physician, Dr. T. N. Carey, in his office at the medical school, at 9 A.M. daily, except Saturday and Sunday. In case of necessity, students will be seen at their homes.

3. *Hospitalization*—If it becomes necessary for any student to enter the hospital during the school year, the school has arranged for the payment of part or all of his hospital expenses, depending on the length of his stay and special expenses incurred. This applies only to students admitted through the school physician's office.

4. *Physical Defects*—Prospective students are advised to have any known physical defects corrected before entering school in order to prevent loss of time which later correction might incur.

5. *Eye Examination*—Each new matriculate is required to undergo an eye examination at the hands of an oculist (Doctor of Medicine) within three months before entering the School of Medicine. Long study hours bring out unsuspected eye defects which cause much loss of time and inefficiency in study if not corrected until after school work is under way.

6. *Limitations*—It is not the function of this service to treat chronic conditions contracted by students before admission, nor to extend treatment to acute conditions arising in the period between academic years, unless the school physician recommends this service.

GENERAL RULES

The right is reserved to make changes in the curriculum, the requirements for graduation, the fees and in any of the regulations whenever the university authorities deem it expedient.

ADVANCEMENT AND GRADUATION

1. All students are required to take the spring examinations unless excused by the Dean.

2. When a student has failures in two completed major courses, he or she shall be dropped from the rolls of the Medical School.

3. No student will be permitted to pass to a higher class with conditions.

4. Should a student be required to repeat any year in the course, he must pay regular fees.

5. A student failing in final examinations for graduation at the end of the fourth year will be required to repeat the entire course of the fourth year and to take examinations in such other branches as may be required, should he again be permitted to enter the school as a candidate for graduation.

6. The general fitness of a candidate for graduation, as well as the results of his examinations, will be taken into consideration by the faculty.

EQUIPMENT

7. At the beginning of the first year, all students must be prepared to purchase microscopes of a satisfactory type equipped with a mechanical stage and a sub-stage lamp.

A standard microscope of either Bausch & Lomb, Leitz, Spencer, or Zeiss make, fitted with the following attachments, will fill the requirements:

Oculars: 10 x and 5 x.

Triple nose piece with 16 mm., 4 mm., and 1.9 mm. 125 N.A. oil immersion lens.

Wide aperture stage with quick screw condenser.

All used microscopes are subject to inspection and approval before their use in the laboratory is permitted. The student is cautioned against the purchase of such an instrument before its official approval by the school.

8. Students in the second year class are required to provide stethoscopes.

9. Third- and fourth-year students are required to provide haemocytometers, ophthalmoscopes and otoscopes.

STATE QUALIFYING CERTIFICATES

10. Candidates for admission who live in or expect to practice medicine in Pennsylvania, New Jersey or New York must file State certificates in the office of

the Committee on Admissions, School of Medicine, before registration. No exception will be made to this rule.

EYE EXAMINATION BEFORE ADMISSION

11. Each new matriculate in each class is required to present to the Committee on Admissions a certificate from an oculist, (a graduate in medicine) that the matriculate's eyes have been examined and are in condition, with or without glasses as the case may be, to endure the strain of close and intensive reading.

It is required that this examination be completed within three months prior to registration and that the certificate be mailed to the Committee on Admissions not later than one month before registration.

AWARDING OF COMBINED DEGREES

12. Students entering the School of Medicine on a three-year requirement basis from colleges which usually grant a degree on the successful completion of the first year of medicine, are restricted by the following regulations:

- a—The candidate must present a certificate from his college or university that he has absolved the quantitative and qualitative premedical requirements for this degree.
- b—The candidate must acquire an average of "C" or better for the work of his first year in the School of Medicine.
- c—The Dean of the School of Medicine reserves the right to withhold his recommendation that a bachelor's degree be conferred at a commencement which occurs before the official release of first-year medical grades.

COST OF TRANSCRIPTS

13. Graduates will receive the first transcript of record without charge. Subsequent copies will cost one dollar each. Requests for transcripts must be filed with the Registrar's Office, University of Maryland, Lombard and Greene Streets, Baltimore-1, Maryland.

PRIZES

THE FACULTY PRIZE

The faculty will award the gold medal and five certificates of honor to those six of the first ten highest ranking candidates for graduation who, during the four academic years, have exhibited outstanding qualifications for the practice of medicine.

THE DR. A. BRADLEY GAITHER MEMORIAL PRIZE

A prize of \$25.00 is given each year by Mrs. A. Bradley Gaither as a memorial to the late Dr. A. Bradley Gaither, to the student in the senior class doing the best work in genito-urinary surgery.

SCHOLARSHIPS

All scholarships are assigned for one academic year, unless specifically reawarded on consideration of an application.

Official application forms are obtainable at the Dean's office, where they should be filed two months before the ensuing academic year.

THE DR. SAMUEL LEON FRANK SCHOLARSHIP

(Value \$100.00)

This scholarship was established by Mrs. Bertha Rayner Frank as a memorial to the late Dr. Samuel Leon Frank, an alumnus of this university.

It is awarded by the Trustees of the Endowment Fund of the University each year upon nomination by the Faculty Board "to a medical student of the University of Maryland, who in the judgment of said Council, is of good character and in need of pecuniary assistance to continue his medical course."

This scholarship is awarded to a second, third or fourth year student who has successfully completed one year's work in this school. No student may hold this scholarship for more than two years.

THE CHARLES M. HITCHCOCK SCHOLARSHIPS

(Value \$100.00 each)

Two scholarships were established from a bequest to the School of Medicine by the late Charles M. Hitchcock, M.D., an alumnus of the university.

These scholarships are awarded annually by the Trustees of the Endowment Fund of the University, upon nomination by the Faculty Board, to students who have meritoriously completed the work of at least the first year of the course in medicine, and who present to the Board satisfactory evidence of a good moral character and of inability to continue the course without pecuniary assistance.

THE RANDOLPH WINSLOW SCHOLARSHIP

(Value \$100.00)

This scholarship was established by the late Randolph Winslow, M.D., LL.D.

It is awarded annually by the Trustees of the Endowment Fund of the University, upon nomination by the Faculty Board, to a "needy student of the Senior, Junior, or Sophomore Class of the Medical School."

"He must have maintained an average grade of 85% in all his work up to the time of awarding the scholarship."

"He must be a person of good character and must satisfy the Faculty Board that he is worthy of and in need of assistance."

THE DR. LEO KARLINSKY MEMORIAL SCHOLARSHIP

(Value \$125.00)

This scholarship was established by Mrs. Ray Mintz Karlinsky as a memorial to her husband, the late Dr. Leo Karlinsky, an alumnus of the university.

It is awarded annually by the Trustees of the Endowment Fund of the University, upon the nomination of the Faculty Board, to "a needy student of the Senior, Junior or Sophomore Class of the Medical School."

He must have maintained in all his work up to the time of awarding the scholarship a satisfactory grade of scholarship.

He must be a person of good character and must satisfy the Faculty Board that he is worthy of and in need of assistance.

THE UNIVERSITY SCHOLARSHIP

A scholarship which entitles the holder to exemption from payment of tuition fee for the year, is awarded annually by the Faculty Board to a student of the senior class in need of assistance who presents to the Faculty Board satisfactory evidence of good character and scholarship.

THE FREDERICA GEHRMANN SCHOLARSHIP

(Value \$200.00)

(Not open to holders of Warfield and Cohen Scholarships)

This scholarship was established by the bequest of the late Mrs. Frederica Gehrmann and is awarded to a third-year student who at the end of the second year has passed the best practical examinations in physiology, pharmacology, pathology, bacteriology, immunology, serology, surgical anatomy and neuro-anatomy.

THE CLARENCE AND GENEVRA WARFIELD SCHOLARSHIPS

(Value \$300.00 each)

There are five scholarships established by the regents from the income of the fund bequeathed by the will of Dr. Clarence Warfield.

Terms and Conditions: These scholarships are available to students of any of the classes of the course in medicine. Preference is given to students from the counties of the state of Maryland which the Faculty Board may from time to time determine to be most in need of medical practitioners.

Any student receiving one of these scholarships must agree, after graduation and a year's internship, to undertake the practice of medicine, for a term of two years, in the county to which the student is accredited, or in a county selected by the Board. In the event that a student is not able to comply with the condition requiring him to practice in the county to which he is accredited by the Board, the money advanced by the regents shall be refunded by the student.

THE ISRAEL AND CECILIA E. COHEN SCHOLARSHIP

(Value \$150.00)

This scholarship was established by the late Eleanor S. Cohen in memory of her parents, Israel and Cecelia E. Cohen. Terms and conditions: This scholarship will be available to students of any one of the classes of the course in medicine; preference is given to students of the counties in the state of Maryland which the

Faculty Board may from time to time determine to be most in need of medical practitioners. Any student receiving one of these scholarships must, after graduation and a year's internship, agree to undertake the practice of medicine for a term of two years in the county to which the student is accredited, or in a county selected by the council. In the event that a student is not able to comply with the condition requiring him to practice in the county to which he is accredited by the Board, the money advanced by the regents shall be refunded.

THE DR. HORACE BRUCE HETRICK SCHOLARSHIP

(Value \$125.00)

This scholarship was established by Dr. Horace Bruce Hetrick as a memorial to his sons, Bruce Hayward Hetrick and Augustus Christian Hetrick. It is to be awarded by the Faculty Board to a student of the senior class.

THE HENRY ROLANDO SCHOLARSHIP

(Value approximately \$250.00)

The Henry Rolando Scholarship was established by the Board of Regents of the University of Maryland from a bequest to the Board by the late Anne H. Rolando for the use of the Faculty of Medicine.

This scholarship will be awarded each academic year on the recommendation of the Faculty Board to a "poor and deserving student."

THE READ SCHOLARSHIPS

The sum of \$500.00 is now available to cover two (2) scholarships in the amount of \$250.00 each for the scholastic year, beginning in 1945, as a donation from the Read Drug and Chemical Company of Baltimore, Maryland. Two students are to be selected by the Dean of the School in collaboration with the Scholarship and Loan Committee of the Medical School with the provision that the students selected shall be worthy, deserving students, residents of the State of Maryland.

LOAN FUNDS

W. K. KELLOGG FUND

This loan fund was established in the academic year 1942 with money granted by the W. K. Kellogg Foundation. The interest paid on the loans, together with the principal of the fund as repaid, will be used to found a rotating loan fund. Loans will be made on the basis of need, character and scholastic attainment.

FACULTY OF MEDICINE LOAN FUND

A Faculty of Medicine Loan Fund was established with money derived from the bequest of Dr. William R. Sanderson, Class 1882, and the gift of Dr. Albert Stein, Class 1907. Loans will be made on the basis of need, character, and scholastic ability.

THE JAY W. EATON LOAN FUND

This fund was established by the local chapter of the Nu Sigma Nu Fraternity in memory of Jay W. Eaton of the class of 1946.

Beginning in 1946 an interest-free loan of \$100.00 will be made to some worthy member of the senior class, on recommendation of the Scholarship Committee of the School of Medicine. This loan is to be credited to the tuition fee of the appointed student and is to be repaid by the student within four years following his graduation.

THE SENIOR CLASS LOAN FUND

The senior class of 1945 originated this fund which will accumulate by subscription from among members of each senior class.

The conditions of the agreement provide that the dean of the School of Medicine award a loan of \$100.00 to a needy member of the senior class on the recommendation of a self-perpetuating committee of two members of the faculty.

Loans from this fund are to be credited to the tuition fee of the appointed student and are to be repaid within five years from the date of graduation.

ORGANIZATION OF THE CURRICULUM

The curriculum is organized under thirteen departments.

1. Anatomy (including Histology and Embryology).
2. Physiology.
3. Bacteriology and Immunology.
4. Biological Chemistry.
5. Pharmacology and Materia Medica.
6. Pathology.
7. Medicine (including Medical Specialties).
8. Surgery (including Surgical Specialties).
9. Obstetrics.
10. Gynecology.
11. Ophthalmology.
12. Roentgenology.
13. Anaesthesiology.

The instruction is given in four academic years of graded work.

Several courses of study extend through two years or more, but in no case are the students of different years thrown together in the same course of teaching.

The first and second years are devoted largely to the study of the structures, functions and chemistry of the normal body. Laboratory work occupies most of the student's time during these two years.

Some introductory instruction in medicine and surgery is given in the second year. The third and fourth years are almost entirely clinical.

A special feature of instruction in the school is the attempt to bring together teacher and student in close personal relationship. In many courses of instruction the classes are divided into small groups and a large number of instructors insure attention to the requirements of each student.

In most courses the final examination as the sole test of proficiency has disappeared and the student's final grade is determined largely by partial examinations, recitations and assigned work carried on throughout the course.

DEPARTMENT OF GROSS ANATOMY

EDUARD UHLENHUTH.....	Professor of Anatomy
FRANK H. J. FIGGE.....	Associate Professor of Gross Anatomy
R. DALE SMITH.....	Assistant Professor of Gross Anatomy
.....	Instructor in Gross Anatomy

OTTO C. BRANTIGAN.....	Professor of Surgical Anatomy
W. WALLACE WALKER.....	Assistant Professor of Surgical Anatomy
WILLIAM B. SETTLE.....	Associate in Surgical Anatomy
HARRY C. BOWIE.....	Instructor in Surgical Anatomy
HERBERT E. REIFSCHNEIDER.....	Instructor in Surgical Anatomy
ROSS Z. PIERPONT.....	Assistant in Surgical Anatomy

GROSS ANATOMY. *First Year.* First semester. Six lectures and conferences and seventeen laboratory hours a week during the first fifteen weeks; eleven lectures and conferences and twenty-seven laboratory hours a week during the following two weeks.

This course comprises the dissection of the head, neck, chest, abdomen, pelvis and upper extremity; in addition, there is presented an extensive demonstration course of specially dissected preparations of the pelvis and perineum, and a separate lecture course on the peripheral nervous system. Members of the staff.

First Year. Second semester. One lecture and four laboratory hours a week during February and March, comprising the dissection of the lower extremity. Dr. Smith.

First semester.....	421 hours
Second semester.....	40 hours
Total.....	461 hours

TOPOGRAPHIC AND SURGICAL ANATOMY. *Second Year.* The course is designed to bridge the gap between abstract anatomy and clinical anatomy as applied to the study and practice of medicine and surgery. Students are required to dissect and to demonstrate all points, outlines, and regions on the cadaver. Underlying regions are dissected to bring out outlines and relations of structures.

Two lectures and two laboratory periods are given each week during the second semester. Drs. Brantigan, Walker, Settle, Bowie, H. E. Reifschneider, and Pierpont.

Total hours: 96.

ADVANCED ANATOMY (*elective course*). Selected problems in gross anatomy. This course is intended to offer to the upper class student an opportunity of extending the knowledge secured in the freshman course. Drs. Uhlenhuth and Brantigan

Total hours: By arrangement.

In addition to the above course, facilities for special anatomical problems are offered to the more advanced student and physician.

Graduate Courses. Consult the catalogue of the Graduate School for descriptions of the graduate courses offered by members of the staff.

DEPARTMENT OF HISTOLOGY AND EMBRYOLOGY

CARL L. DAVIS.....	Professor of Anatomy
O. G. HARNE.....	Associate Professor of Histology
JOHN F. LUTZ	Assistant Professor of Histology

First Year. The course in histology is divided equally between the study of the fundamental tissues and that of organs. Throughout the entire course the embryology of the part being studied precedes the study of the fully developed tissue. Thus embryology becomes a correlated part of the whole subject of microscopic anatomy and not an independent subject.

Each student is furnished a set of histological slides, previously prepared in our own laboratory, thus insuring a uniform and satisfactory quality of material for study and permitting the time of the student to be expended in the study of material rather than in the technic of its preparation. The object of the course is to present the evidence of function as shown by the structure of tissues and organs. Drs. Davis, Lutz and Harne.

An optional laboratory course is offered. This supplements the required course giving laboratory experience which can not be incorporated in the former. No added charge is made for the course.

Total hours: 150.

NEURO-ANATOMY

First Year. Neuro-anatomy embraces a study of the fundamental structure of the central nervous system as applied to its function. An abundance of material permits of individual dissection of the human brain. A series of appropriately stained sections of the human brain stem is furnished each student for the microscopic study of the internal structure of the nervous system. Drs. Davis, Lutz and Harne.

Total hours: 100.

Graduate Courses. Consult the catalogue of the Graduate School for descriptions of the graduate courses offered by members of the staff.

DEPARTMENT OF PHYSIOLOGY

WILLIAM R. AMBERSON.....	Professor of Physiology
DIETRICH CONRAD SMITH.....	Associate Professor of Physiology
ROBERT H. OSTER.....	Associate Professor of Physiology
RUBERT S. ANDERSON	Assistant Professor of Physiology
MARY E. CHINN.....	Instructor in Physiology
JUNE LINDA SNYDER.....	Assistant in Physiology

Four lectures, one conference and two laboratory periods a week, 1st semester of each academic year. The fundamental concepts of physiology are presented with special reference to mammalian problems.

Total hours: 224.

Graduate Courses. Consult the catalogue of the Graduate School for descriptions of the graduate courses offered by members of the staff.

DEPARTMENT OF BACTERIOLOGY AND IMMUNOLOGY

FRANK W. HACHTEL.....	Professor of Bacteriology
JAMES G. McALPINE.....	Associate Professor of Bacteriology
H. EDMUND LEVIN.....	Associate in Bacteriology
HENRY F. BUETTNER.....	Instructor in Bacteriology

The principles of general bacteriology are taught by quiz, conference, and lecture.

Instruction in bacteriology is given in the laboratory to students of the second year class during the first semester. This includes the methods of preparation of culture media, the study of pathogenic bacteria, and the bacteriological examination of water and milk. The bacteriological diagnosis of communicable diseases is also included.

The principles of immunology are presented by means of quizzes, conferences and lectures to the second year class in the second semester.

The course includes a consideration of infection and immunity, the nature and action of the various antibodies, complement fixation and flocculation tests, hypersensitiveness, and the preparation of bacterial vaccines.

Experiments are carried out by the class in the laboratory. During the latter half of the semester the class is divided into sections.

Total hours: Bacteriology 120.

Immunology 72.

Graduate Courses. Consult the catalogue of the Graduate School for descriptions of the graduate courses offered by members of the staff.

DEPARTMENT OF BIOLOGICAL CHEMISTRY

H. BOYD WYLIE.....	Professor of Biological Chemistry
EMIL G. SCHMIDT.....	Associate Professor of Biological Chemistry
FRANK N. OGDEN.....	Associate in Biological Chemistry
ANN VIRGINIA BROWN.....	Instructor in Biological Chemistry

This course is designed to present the principles of biological chemistry and to indicate their applications to the clinical aspects of medicine. The phenomena of living matter and its chief ingredients, secretions and excretions are discussed in lectures and conferences and examined experimentally. Training is given in biochemical methods of investigation. Total hours: 208.

Graduate Courses. Consult the catalogue of the Graduate School for descriptions of the graduate courses offered by members of the staff.

DEPARTMENT OF PHARMACOLOGY

JOHN C. KRANTZ, JR.	Professor of Pharmacology
C. JELLEFF CARR	Associate Professor of Pharmacology
HARRY K. IWAMOTO	Assistant Professor of Pharmacology
NATHANIEL M. BECK	Instructor in Pharmacology
RUTH MUSSER	Instructor in Pharmacology
WILLIAM G. HARNE	Demonstrator in Pharmacology
FREDERICK K. BELL	U. S. Pharmacopoeia Fellow
DOROTHY K. SHIPLEY	Fellow in Pharmacology
ELAINE GABY	Emerson Fellow in Pharmacology
MARY J. SAUERWALD	Emerson Fellow in Pharmacology

This course is designed to include those phases of pharmacology necessary for an intelligent use of drugs in the treatment of disease. The didactic instruction includes materia medica, pharmacy, prescription-writing, toxicology, posology, pharmacodynamics, and experimental therapeutics. The laboratory exercises parallel the course of lectures.

In addition, optional conference periods and lectures are available for students desiring further instruction or advice.

Total hours: 216.

Graduate Courses. Consult the catalogue of the Graduate School for descriptions of the graduate courses offered by members of the staff.

DEPARTMENT OF PATHOLOGY

HUGH R. SPENCER	Professor of Pathology
ROBERT B. WRIGHT	Associate Professor of Pathology
C. GARDNER WARNER	Associate Professor of Pathology
WALTER C. MERKEL	Assistant Professor of Pathology
ALBERT E. GOLDSTEIN	Assistant Professor of Pathology
HOWARD J. MALDEIS	Associate in Pathology
JOHN A. WAGNER	Associate in Pathology
DEXTER L. REIMANN	Associate in Pathology
MILTON S. SACKS	Instructor in Pathology
CONRAD B. ACTON	Instructor in Pathology
ROLAND E. BIEREN	Instructor in Pathology
HOWARD B. MAYS	Instructor in Pathology
EPHRAIM T. LISANSKY	Instructor in Pathology
D. MCCLELLAND DIXON	Instructor in Pathology
HELEN A. HORN	Instructor in Pathology
WILLIAM B. VANDEGRIFT	Instructor in Pathology
SEYMOUR W. RUBIN	Assistant in Pathology
ERNEST G. GUY	Weaver Fellow in Pathology

Courses of instruction in pathology are given during the second and third years. The courses are based on the previous study of normal structure and function and aim to outline the history of disease. The relationship between clinical symptoms and anatomical lesions is constantly stressed.

GENERAL PATHOLOGY. *Second Semester, Second Year.* This course includes the study of disturbances of the body fluids; disturbances of structure, nutrition and metabolism of cells; disturbances of fat, carbohydrate and protein metabolism; disturbances of pigment metabolism; inflammation and tumors.

Laboratory instruction is based on the study of prepared slides (loan collection) and corresponding gross material.

APPLIED PATHOLOGY, INCLUDING GROSS MORBID ANATOMY AND MORBID PHYSIOLOGY. *Third Year.* The laboratory instruction in this course is carried out in small teaching museums where prepared specimens and material from autopsies with clinical histories and sections are available for study. For this work the class is divided into small groups. Clinical correlation is stressed.

AUTOPSIES. *Third Year.* Students in small groups attend autopsies at the morgues of the University Hospital and the Baltimore City Hospitals.

CLINICAL-PATHOLOGICAL CONFERENCE. (*Fourth Year.*) These exercises are held in collaboration with the Department of Medicine. Selected cases are discussed and autopsy findings are presented.

Second year.....	184 hours
Third year.....	160 hours
Fourth year.....	30 hours
Total	374 hours

DEPARTMENT OF MEDICINE

MAURICE C. PINCOFFS.....	Professor of Medicine
JOSEPH E. GICHNER.....	Professor of Clinical Medicine and Physical Therapeutics
G. CARROLL LOCKARD.....	Professor of Clinical Medicine
THOMAS P. SPRUNT.....	Professor of Clinical Medicine
H. RAYMOND PETERS.....	Professor of Clinical Medicine
PAUL W. CLOUGH.....	Associate Professor of Medicine
WALTER A. BAETJER.....	Associate Professor of Medicine
WILLIAM S. LOVE, JR.....	Associate Professor of Medicine
LOUIS A. M. KRAUSE.....	Associate Professor of Medicine
T. NELSON CAREY.....	Associate Professor of Medicine
WILLIAM H. SMITH.....	Associate Professor of Clinical Medicine
HOWARD J. MALDEIS.....	Associate Professor of Legal Medicine
GEORGE McLEAN.....	Assistant Professor of Medicine
JOHN E. LEGGE.....	Assistant Professor of Medicine
THOMAS C. WOLFF.....	Assistant Professor of Medicine
H. M. BUBERT.....	Assistant Professor of Medicine
J. S. EASTLAND.....	Assistant Professor of Medicine
MILTON S. SACKS.....	Assistant Professor of Medicine
LEWIS P. GUNDRY.....	Assistant Professor of Medicine
CHARLES R. GOLDSBOROUGH.....	Lecturer in Medicine
CLARK H. YEAGER.....	Lecturer in Tropical Medicine
WETHERBEE FORT.....	Associate in Medicine
FRANK J. GERAGHTY.....	Associate in Medicine
E. H. TONOLLA.....	Associate in Medicine
*HARRY V. LANGELOTTIG.....	Associate in Medicine
SOL SMITH.....	Associate in Medicine

DAVID TENNER	Instructor in Medicine
R. B. MITCHELL, JR.	Instructor in Medicine
SAMUEL LEGUM	Instructor in Medicine
M. S. SHILING	Instructor in Medicine
H. EDMUND LEVIN	Instructor in Medicine
ROBERT A. REITER	Instructor in Medicine
W. GRAFTON HERSPERGER	Instructor in Medicine
MEYER W. JACOBSON	Instructor in Medicine
CONRAD ACTON	Instructor in Medicine
HUGH G. WHITEHEAD	Instructor in Medicine
PHILIP D. FLYNN	Instructor in Medicine
EDWARD S. KALLINS	Instructor in Medicine
IRVING FREEMAN	Instructor in Medicine
JOHN A. MYERS	Instructor in Medicine
KURT LEVY	Instructor in Medicine
WILLIAM G. HELFRICH	Instructor in Medicine
FRANCIS G. DICKEY	Instructor in Medicine
C. EDWARD LEACH	Instructor in Medicine
LAWRENCE M. SERRA	Instructor in Medicine
MARIE A. ANDERSCH	Instructor in Medicine
M. PAUL PADGET	Instructor in Medicine
W. H. TRIPPLETT	Assistant in Medicine
MORRIS FINE	Assistant in Medicine
WILLIAM H. GRENZER	Assistant in Medicine
★GEORGE SILVERTON	Assistant in Medicine
★LAWRENCE KATZENSTEIN	Assistant in Medicine
LEON ASHMAN	Assistant in Medicine
HARRY M. ROBINSON, JR.	Assistant in Medicine
NATHANIEL M. BECK	Assistant in Medicine
PAUL E. CARLINER	Assistant in Medicine
SAMUEL SNYDER	Assistant in Medicine
S. EDWIN MULLER	Assistant in Medicine
LOUIS J. KROLL	Assistant in Medicine
WILLIAM K. WALLER	Assistant in Medicine
EPHRAIM T. LISANSKY	Assistant in Medicine
★NACHMAN DAVIDSON	Assistant in Medicine
SAMUEL T. R. REVELL	Assistant in Medicine
ARTHUR KARFGIN	Assistant in Medicine
JOSEPH E. MUSE, JR.	Assistant in Medicine
DANIEL WILFSON, JR.	Assistant in Medicine
JOSEPH B. GROSS	Assistant in Medicine
SAMUEL J. HANKIN	Assistant in Medicine
CHARLES W. KNERLER	Assistant in Medicine
★ROBERT L. GIBBS	Assistant in Medicine
JAMES R. KARNS	Assistant in Medicine
★ROBERT B. MEARNs	Assistant in Medicine
WILLIAM H. KAMMER, JR.	Assistant in Medicine
L. ANN HELLEN	Assistant in Medicine
LESLIE HARRELL PIERCE	Assistant in Medicine
AUDREY M. FUNK	Assistant in Medicine

FREDERICK J. VOLLMER.....	Assistant in Medicine
MARGARET VIRGINIA PALMER.....	Assistant in Medicine
JOHN R. DAVIS.....	Assistant in Medicine
*J. EMMETT QUEEN.....	Assistant in Medicine
JOHN Z. BOWERS.....	Assistant in Medicine
ROLLIN C. HUDSON.....	Assistant in Medicine

GENERAL OUTLINE

SECOND YEAR

Introduction to clinical medicine.

- (a) Introductory physical diagnosis. (1 hour a week, first semester; 2 hours a week, second semester.)
- (b) Medical clinics. (1 hour a week, second semester.)

THIRD YEAR

- I. The methods of examination (13 hours a week). (a) History taking. (b) Physical diagnosis. (c) Clinical pathology.

These subjects are taught and practiced in the hospital out-patient department and in the clinical laboratory.

- II. The principles of medicine (200 hours).

- (a) Lectures, clinics and demonstrations in general medicine, neurology, pediatrics psychiatry and preventive medicine.

- III. The principles of therapeutics (15 hours). Lectures and demonstrations.

FOURTH YEAR

The practice of medicine.

- I. Clinical clerkship on the medical wards. (26 hours a week for ten weeks.)

- (a) Responsibility, under supervision, for the history, physical examination, laboratory examinations and progress notes of assigned cases.

- (b) Ward classes in general medicine, the medical specialties, and therapeutics.

- II. Clinics in general medicine and the medical specialties.

(6 hours a week.)

- III. Dispensary work in the medical specialties.

- IV. Clinical-pathological conferences (1 hour a week).

MEDICAL DISPENSARY WORK

The medical dispensaries of both the Mercy and the University Hospitals are utilized for teaching in the third year. Each student spends two hours daily for ten weeks in dispensary work. The work is done in groups of four to six students under an instructor. Systematic history-taking is especially stressed. Physical findings are demonstrated. The student becomes familiar with the commoner acute and chronic disease processes.

PHYSICAL DIAGNOSIS

Second Year. Didactic lectures and practical demonstrations in topographical anatomy and normal physical signs. Dr. McLean.

Third Year. The class is divided into small groups and each section receives instruction for two hours daily for ten weeks. This course is given at the

Baltimore City Hospitals. The large clinical material there is utilized to give each student the opportunity to familiarize himself with the common types of bodily structure, with the normal variations in physical signs and with the physical signs of the chief pulmonary, circulatory and abdominal diseases. A course of lectures (1 hour a week) on physical diagnosis supplements the practical work in this subject. Drs. Wolff, Reiter, Ashman, Kroll, Legum and Willson.

THERAPEUTICS

Third Year. General therapeutics and materia medica are taken up and an effort is made to familiarize the student with the practical treatment of disease. The special therapy of the chief diseases is then reviewed. One hour a week. Dr. Lockard.

Fourth Year. Special consideration is given to the practical application of therapeutic principles in bedside teaching and the chief therapeutic methods are demonstrated.

Students attend therapeutic ward rounds once a week throughout their medical trimester.

TROPICAL MEDICINE

Certain phases of tropical medicine are considered in the course on clinical pathology. In addition, Dr. Clark H. Yeager conducts a course of lectures and demonstrations to the entire fourth year class. The course occupies one hour weekly for twenty weeks.

TUBERCULOSIS

During the third year in connection with the instruction in physical diagnosis a practical course is given at the Municipal Tuberculosis Hospital. Stress is laid upon the recognition of the physical signs of the disease, as well as upon its symptomatology and gross pathology.

CARDIOLOGY

In the third year a series of lectures and clinics correlated with pathological studies is given the entire class.

During the fourth year an elective course in cardiology is offered at the Mercy Hospital. The course occupies one and one-half hours weekly. Physical diagnosis, electrocardiography and the therapeutic management of cardiac cases are stressed.

Elective outpatient work is available also to members of the fourth year class in the cardiac clinic of the University Hospital.

SYPHILIS

Third Year. During the third year the subject of syphilis is dealt with in the lecture course.

Fourth Year. An elective course in the therapeutic management of syphilis is offered in the dispensary.

CLINICAL PATHOLOGY

MILTON S. SACKS

Assistant Professor of Medicine and Head of Department of Clinical Pathology

SOL SMITH.....Associate in Medicine

JOHN A. MYERS.....Instructor in Medicine

MARIE A. ANDERSCH.....Biochemist, University Hospital, Instructor in Medicine

HUGH G. WHITEHEAD.....Assistant in Medicine

S. EDWIN MULLER.....Assistant in Medicine

JOHN A. WAGNER.....Assistant in Medicine

DEXTER L. REIMANN.....Assistant in Medicine

L. ANN HELLEN.....Assistant in Medicine

AUDREY M. FUNK.....Assistant in Medicine

During the third year the student is thoroughly drilled in the technic of the usual clinical laboratory work, so that he is able to perform all routine examinations which may be called for during his fourth year, in connection with the work in the wards and dispensary.

The practical work is supplemented by a series of didactic lectures and demonstrations in which the entire teaching staff of the department takes an active part. The microscopical and chemical study of blood, exudates and transudates, gastric juice, spinal fluid, feces and urine are successively taken up, and special attention directed to the clinical significance of the findings.

Clinical parasitology from the standpoint of the infecting agent and the carrier is given careful consideration.

The entire course is thoroughly practical. Each student provides his own microscope and blood counters and is supplied a haemoglobinometer for his exclusive use. Every two students are equipped with a special laboratory outfit for all routine purposes.

During the fourth year the student applies in the laboratories of the various affiliated hospitals what he has learned during the preceding year. He is also supplied with a laboratory outfit which is sufficiently complete to enable him to work independently of the general equipment. Special instructors are available during certain hours to give necessary assistance and advice.

GASTRO-ENTEROLOGY

THEODORE H. MORRISON.....Clinical Professor of Gastro-Enterology

MAURICE FELDMAN.....Assistant Professor of Gastro-Enterology

ZACHARIAH MORGAN.....Assistant Professor of Gastro-Enterology

SAMUEL MORRISON.....Assistant Professor of Gastro-Enterology

Z. VANCE HOOPER.....Associate in Gastro-Enterology

ALBERT J. SHOCHAT.....Instructor in Gastro-Enterology

FRANCIS G. DICKEY.....Instructor in Medicine

JOHN A. MYERS.....Assistant in Gastro-Enterology

NATHANIEL M. BECK.....Assistant in Gastro-Enterology

ALFRED S. LEDERMAN.....Assistant in Gastro-Enterology

Third Year. A series of six lectures is given on the diseases of the digestive tract.

Fourth Year. Clinics and demonstrations are given to the class for one hour a week; dispensary instruction to small groups throughout the entire session. Practical instruction is given in the use of modern methods of study of the diseases of the gastro-intestinal tract.

PSYCHIATRY

ROSS MCC. CHAPMAN.....	Professor of Psychiatry
RALPH P. TRUITT.....	Associate Professor of Psychiatry
HARRY GOLDSMITH.....	Assistant Professor of Psychiatry
H. W. NEWELL.....	Assistant Professor of Psychiatry
HARRY M. MURDOCK.....	Assistant Professor of Psychiatry
*LESLIE B. HOHMAN.....	Lecturer in Psychiatry
WILLIAM W. ELGIN.....	Associate in Psychiatry
HANS W. LOEWALD.....	Associate in Psychiatry
A. RUSSELL ANDERSON.....	Instructor in Psychiatry
PHILIP S. WAGNER.....	Instructor in Psychiatry
J. G. N. CUSHING.....	Instructor in Psychiatry
FRANCIS McLAUGHLIN.....	Instructor in Psychiatry
SAMUEL NOVEY.....	Instructor in Psychiatry
KATHRYN L. SCHULTZ.....	Instructor in Psychiatry

First Year. The 16 lecture hours will be devoted largely to a discussion of factors influencing the formation of character and the deviations in personality falling within the range of "normal." The usual endogenous and environmental experiences which provide critical periods during the life of an individual will be chronologically presented. Basic psychological concepts and psycho-dynamics will be reviewed. The methods of psychiatry with reference to the life history, mental status examination, and psychometric testing will be outlined and demonstrated.

Second Year. 14 2-hour lecture demonstrations on psychopathology will introduce the student to personality deviations considered "abnormal." The mental status examination will be demonstrated in detail. The major and minor psychoses will be presented in terms of the psycho-dynamics of symptoms and reaction types. The student will be expected, at the conclusion of the year, to be familiar with the psychopathology and clinical characteristics of the usual psychiatric problems.

Third Year. The 16 lecture hours will be devoted to further considerations of special psychopathology and the principles of psychotherapy. Specialized forms of treatment will be reviewed, but the main emphasis will be toward familiarizing the student with forms of therapy feasible in routine medical practice. During the 36 clinic hours the student will be supervised in history-taking, mental status and psychometric examination, and follow-up studies of patients.

Fourth Year. A series of 10 lecture demonstrations will serve to summarize previous instruction and to appraise the student's insight into psychopathology, the recognition of clinical syndromes, and their management. Characteristic reaction types will be demonstrated and discussed largely as concerns probable etiology and possible preventive measures. The relationship of mental illness to the major problems of social upheaval, economic, and other sources of insecurity will be considered.

PEDIATRICS

C. LORING JOSLIN	Professor of Pediatrics
EDGAR B. FRIEDENWALD	Professor of Clinical Pediatrics
T. CAMPBELL GOODWIN	Associate Professor of Pediatrics
HUGH W. JOSEPHS	Associate Professor of Pediatrics
JOHN H. TRABAND	Assistant Professor of Pediatrics
ALBERT JAFFE	Assistant Professor of Pediatrics
A. H. FINKELSTEIN	Assistant Professor of Pediatrics
FREDERICK B. SMITH	Assistant Professor of Pediatrics
J. EDMUND BRADLEY	Assistant Professor of Pediatrics
CLEWELL HOWELL	Associate in Pediatrics
SAMDEL S. GLICK	Associate in Pediatrics
WILLIAM M. SEABOLD	Associate in Pediatrics
G. BOWERS MANSDORFER	Associate in Pediatrics
M. PAUL BYERLY	Instructor in Pediatrics
JEROME FINEMAN	Instructor in Pediatrics
B. MATTHEW DEBUSKEY	Instructor in Pediatrics
GIBSON J. WELLS	Instructor in Pediatrics
ARNOLD F. LAVENSTEIN	Instructor in Pediatrics
MARY L. HAYLECK	Instructor in Pediatrics
W. J. SCHMITZ	Assistant in Pediatrics
ISRAEL P. MERANSKI	Assistant in Pediatrics
LAURISTON L. KEOWN	Assistant in Pediatrics
*EARLE S. SCOTT	Assistant in Pediatrics
*WILLIAM EARL WEEKS	Assistant in Pediatrics
*THOMAS A. HEDRICK	Assistant in Pediatrics
*J. CARLTON WICH	Assistant in Pediatrics
*A. ROBERT MARKS	Assistant in Pediatrics

Third Year. The course is presented as follows:

Lectures on infant feeding and the fundamentals of diseases of infants and children. (15 hours.)

Lectures on contagious diseases in conjunction with the Department of Hygiene and Preventive Medicine. (14 hours.)

A special course in physical diagnosis is given at City Hospitals. (20 hours.)

Clinical conferences demonstrating diseases of the new-born. (6 hours.)

Fourth Year. An amphitheatre clinic is given at which patients are shown to demonstrate the features of the diseases discussed. (30 hours.)

Conferences and demonstrations are given in problems concerning diagnosis, care, treatment and clinical pathology of the diseases of infants and children. (30 hours.)

Students are assigned subjects for the preparation of theses.

Clinical clerkships are assigned on the pediatric wards, where experience is gained in taking histories, making physical examinations, doing routine laboratory work, and following up the patients' progress. This is under the supervision of the visiting staff. (140 hours.)

Instruction is given in the pediatric clinic of the out-patient department of the University Hospital. This consists of 1½ hours daily for five weeks—30 minutes each day being devoted to a clinical demonstration of some interesting

case by a member of the staff; one hour daily to taking histories and making physical examinations under supervision of one of the staff instructors. (45 hours.)

Total hours: 300.

NEUROLOGY

IRVING J. SPEAR	Professor of Neurology
ANDREW C. GILLIS	Professor of Neurology
LEON FREEDOM	Associate Professor of Neurology
PHILIP F. LERNER	Associate in Neurology
WILLIAM L. FEARING	Instructor in Neurology
EDWARD F. COTTER	Assistant in Neurology
HARRY A. TEITELBAUM	Assistant in Neurology
JOHN W. MACHEN	Assistant in Neurology
GEORGE C. MEDAIRDY	Assistant in Neurology

Second Year. Fifteen one-hour lectures are given to correlate the anatomy and physiology of the nervous system with clinical neurology.

Third Year. Twenty hours of instruction are given to the whole class in neuropathology supplemented with pathological demonstrations. Sixteen lecture-demonstrations are given in which the major types of the diseases of the nervous system are discussed. A course is also given at the Baltimore City Hospitals, comprising eight periods of two hours each, in which the students in small groups carry out complete neurological examinations of selected cases which illustrate the chief neurological syndromes.

Fourth Year. A clinical conference one hour each week is given to the whole class at the University and Mercy Hospitals. All patients presented at these clinics are carefully examined. Complete written records are made by the students who demonstrate the patients before the class. The patients are usually assigned one or two weeks before they are presented, and each student in the class must study and present one or more patients during the year.

Ward Class Instruction. Nine hours of instruction are given to each student in small sections at the University and Mercy Hospitals. In these classes the students come in close personal contact with the patients in the wards under the supervision of the instructor.

Dispensary Instruction. Small sections are instructed in the dispensaries of the University and Mercy Hospitals five afternoons each week. In this way students are brought into contact with nervous diseases in their early and late manifestations.

HYGIENE AND PUBLIC HEALTH

HUNTINGTON WILLIAMS	Professor of Hygiene and Public Health
WILLIAM H. F. WARTHEN	Assistant Professor of Hygiene and Public Health
ROSS DAVIES	Assistant Professor of Hygiene and Public Health
MYRON G. TULL	Lecturer in Hygiene and Public Health

Third Year. A one-hour lecture is given to the whole class each Monday during both semesters. Basic instruction is afforded in the clinical and public health

aspects of the communicable diseases including syphilis and tuberculosis. The lectures are under the auspices of the Department of Medicine and are given by staff members of that department, including physicians representing pediatrics, hygiene and public health, and the Baltimore City Health Department.

Fourth Year. Six one-hour lectures are given to the whole class at the beginning of the first semester and are on important public health procedures such as maternal and child hygiene, sewage disposal, vital statistics, interstate and international quarantine and research in public health. Elective work is also assigned at Sydenham Hospital, the one-hundred bed communicable disease hospital of the City Health Department, and at its Western Health District, 617 West Lombard Street, where the District Health Officer arranges for home visiting and the student prepares and presents a Home Survey Report.

The course deals with the fundamentals of public health and supplements the work in the third year. The major emphasis in both years is on the practice of preventive medicine and the relation of prevention to diagnosis and treatment, and on the civic and social implications of the medical services.

LEGAL MEDICINE

HOWARD J. MALDEIS.....Associate Professor of Legal Medicine
Chief Medical Examiner, Maryland

Third Year. This course embraces a summary of some of the following: Proceedings in criminal and civil prosecution, medical evidence and testimony, identity and its general relations, rape, criminal abortions, signs of death, wounds in their medico-legal relations, natural and homicidal death, malpractice, insanity, and medico-legal autopsies, including poisoning.

Total hours: 4.

DEPARTMENT OF SURGERY

ARTHUR M. SHIPLEY.....Professor of Surgery
WALTER D. WISE.....Professor of Surgery
CHARLES REID EDWARDS.....Professor of Surgery
ELLIOTT H. HUTCHINS.....Professor of Surgery
CHARLES BAGLEY, JR.....Professor of Neurological Surgery
THOMAS B. AYCOCK.....Professor of Clinical Surgery
F. L. JENNINGS.....Professor of Clinical Surgery
D. J. PESSAGNO.....Professor of Clinical Surgery
MONTE EDWARDS.....Clinical Professor of Surgery
CHARLES A. REIFSCHNEIDER.....Clinical Professor of Traumatic Surgery
RICHARD G. COBLENTZ.....Clinical Professor of Neurological Surgery
EDWARD A. KITLOWSKI.....Clinical Professor of Plastic Surgery
THOMAS R. CHAMBERS.....Associate Professor of Surgery
R. W. LOCHER.....Associate Professor of Clinical Surgery
EDWARD S. JOHNSON.....Associate Professor of Surgery
N. CLYDE MARVEL.....Associate Professor of Surgery
GRANT E. WARD.....Associate Professor of Surgery
CYRUS F. HORINE.....Associate Professor of Surgery
CHARLES W. MAXSON.....Associate Professor of Surgery

GEORGE H. YEAGER	Associate Professor of Surgery
HENRY F. ULLRICH	Associate Professor of Orthopaedic Surgery
C. W. PEAKE	Associate Professor of Surgery
OTTO C. BRANTIGAN	Associate Professor of Surgery
JAMES G. ARNOLD, JR.	Associate Professor of Neurological Surgery
H. F. BONGARDT	Assistant Professor of Surgery
HARRY C. HULL	Assistant Professor of Surgery
I. O. RIDGELY	Assistant Professor of Surgery
JAMES W. NELSON	Assistant Professor of Surgery
I. RIDGEWAY TRIMBLE	Assistant Professor of Surgery
RICHARD T. SHACKELFORD ..	Assistant Professor of Surgery
SIMON H. BRAGER	Assistant Professor of Surgery
THURSTON R. ADAMS	Assistant Professor of Surgery
W. WALLACE WALKER	Assistant Professor of Surgery
RAYMOND F. HELFRICH	Associate in Surgery
E. EUGENE COVINGTON	Associate in Surgery
LUTHER E. LITTLE	Associate in Surgery
WILLIAM B. SETTLE	Associate in Surgery
ARTHUR G. SIWINSKI	Associate in Surgery
WILLIAM F. RIENHOFF, JR.	Associate in Surgery
GEORGE GOVATOS	Associate in Surgery
JOSEPH V. JERARDI	Associate in Surgery
E. M. HANRAHAN	Instructor in Surgery
J. DUER MOORES	Instructor in Surgery
CALVIN HYMAN	Instructor in Surgery
CLYDE F. KARNS	Instructor in Surgery
DANIEL R. ROBINSON	Instructor in Surgery
HERBERT E. REIFSCHNEIDER ..	Instructor in Surgery
GEORGE H. BROUILLET	Instructor in Surgery
HARRY C. BOWIE	Instructor in Surgery
WILLIAM L. GARLICK	Instructor in Surgery
STUART G. COUGHLAN	Instructor in Surgery
HAROLD H. BURNS	Instructor in Surgery
JOHN F. SCHAEFER	Instructor in Surgery
ROBERT F. HEALY	Instructor in Surgery
ROBERT C. SHEPPARD	Instructor in Surgery
WILLIAM R. GERAGHTY	Assistant in Surgery
HOWARD B. McELWAIN	Assistant in Surgery
A. V. BUCHNESS	Assistant in Surgery
T. J. TOUHEY	Assistant in Surgery
SAMUEL H. CULVER	Assistant in Surgery
ALBERT R. WILKERSON	Assistant in Surgery
L. T. CHANCE	Assistant in Surgery
W. ALLEN DECKERT	Assistant in Surgery
HERBERT M. FOSTER	Assistant in Surgery
ROBERT F. CHENOWITH	Assistant in Surgery
*HENRY L. RIGDON	Assistant in Surgery
*HENRY A. BRIELE	Assistant in Surgery
*F. FORD LOKER	Assistant in Surgery
PATRICK C. PHELAN, JR.	Assistant in Surgery
E. RODERICK SHIPLEY	Assistant in Surgery

ROBERT Z. BERRY.....	Assistant in Surgery
PRESTON R. CUTLER.....	Assistant in Surgery
JAMES W. HENDRICK.....	Assistant in Surgery
JOHN O. ROBBEN.....	Assistant in Plastic Surgery
ROSS Z. PIERPONT.....	Assistant in Surgery
WILLIAM C. DUNNIGAN.....	Assistant in Surgery
HOWARD L. ZUPNIK.....	Assistant in Surgery
EDWIN O. DAUE, JR.....	Assistant in Surgery
CHARLES P. SCARBOROUGH.....	Assistant in Plastic Surgery

Instruction is given by means of lectures, laboratory work, recitations, dispensary work, bedside instruction, ward classes, and clinics. The work begins in the second year and continues throughout the third and fourth years.

The teaching is done in the anatomical laboratory, operative surgery laboratory, the dispensaries, wards, laboratories and operating rooms of the University and Mercy Hospitals, and in the wards and operating rooms of the Baltimore City Hospitals.

SECOND YEAR

TOPOGRAPHIC AND SURGICAL ANATOMY. *Second semester.* The course is designed to bridge the gap between anatomy in the abstract and clinical anatomy as applied to the study and practice of medicine and surgery.

The teaching is done in the anatomical laboratory, and students are required to dissect and to demonstrate all points, outlines, and regions on the cadaver. Underlying regions are dissected to bring out outlines and relations of structures.

Two lectures and two laboratory periods per week. Drs. Brantigan, Walker, Settle, Bowie, H. E. Reifschneider and Pierpont.

Total hours: 96.

PRINCIPLES OF SURGERY. *Second semester.* This course includes discussions of irritants, infection, repair of tissue, healing of tissue, relationship of bacteriology to surgery, modern chemotherapy in surgical diseases, ulcers, wounds, thrombophlebitis, phlebothrombosis, peripheral vascular diseases, thermal burns, injuries due to cold, surgical shock, diseases of the lymphatics, gangrene of the skin and extremities, aneurysms, hemorrhage, varicose veins, embolism, sinuses and fistulae, tetanus, anthrax and actinomycosis.

Lectures, two hours a week for one semester, are given to the whole class. Drs. Aycock and Bowie.

THIRD YEAR

GENERAL AND REGIONAL SURGERY. Lectures, recitations and clinics on the principles of surgery, general surgery including fractures and dislocations are given three hours a week to the whole class. Drs. C. R. Edwards and Hull.

The class is divided into groups and receives instruction in history-taking and surgical pathology under the supervision of the chief of the pathologic department of the Baltimore City Hospitals. Instruction is also given in surgical diagnosis and in general surgery at the bedside and in the classroom at this institution by Drs. Aycock, C. A. Reifschneider, Brantigan and Adams. Two hours

per week are given in orthopaedic surgery by Dr. Voshell, chief of the orthopaedic service of this institution.

OPERATIVE SURGERY. Two courses in operative surgery are given under the supervision of Dr. Yeager assisted by Drs. Ullrich, Peake, Brager, Mays, Govatos, Jerardi, Karns, Robinson, Brouillet, Healy and Deckert. The class is divided into sections and each section is given practical and individual work under the supervision of the instructors.

SURGICAL OUT-PATIENT DEPARTMENT. Under supervision, the student takes the history, makes the physical examination, attempts the diagnosis and, as far as possible, carries out the treatment of ambulatory surgical patients in the University and Mercy Hospitals. Mercy Hospital—Dr. Raymond F. Helfrich assisted by the out-patient staff. University Hospital—Drs. Settle and Coughlan assisted by the out-patient staff.

FOURTH YEAR

CLINICS. A weekly clinic is given at the Mercy and at the University Hospitals to one-half the class throughout the year. As far as possible this is a diagnostic clinic. Mercy Hospital—Dr. Wise. University Hospital—Dr. Shipley.

SURGICAL PATHOLOGY. At Mercy Hospital. Specimens from the operating room and museum are studied in the gross and microscopically in relation to the case history. 14 hours. Dr. Pessagno.

SURGERY OF THE CHEST. At Mercy Hospital. Operations and conferences. 14 hours. Dr. Rienhoff.

TRAUMATIC SURGERY. This course deals with operative and post-operative treatment of accident cases and with instructions as to the relationship between the state, the employee, the employer, and the physician's duty to each. One hour a week to sections of the class throughout the year. Dr. C. A. Reifschneider.

CLINICAL CLERKSHIP. This work includes the personal study of assigned hospital patients, under supervision of the staffs of the University and Mercy Hospitals, history-taking, and physical examination of patients, laboratory examinations, attendance at operations and observation of post-operative treatment.

WARD CLASSES. Ward-class instruction in small groups will consist of ward rounds, surgical diagnosis, treatment and the after-care of operative cases. Mercy Hospital—Drs. Wise, Hutchins, Blake, Pessagno, Bongardt, Nelson, Marvel, Maxson, and Jennings. University Hospital—Drs. Shipley, C. Reid Edwards and Aycok.

DERMATOLOGY

HARRY M. ROBINSON, SR.	Professor of Dermatology
FRANCIS A. ELLIS.	Assistant Professor of Dermatology
HARRY M. ROBINSON, JR.	Assistant Professor of Dermatology
LESTER N. KOLMAN.	Instructor in Dermatology
LUCILE J. CALDWELL.	Instructor in Dermatology
EUGENE S. BERESTON.	Instructor in Dermatology
A. ALBERT SHAPIRO.	Instructor in Dermatology
ISRAEL ZELIGMAN.	Instructor in Dermatology
MARK B. HOLLANDER.	Instructor in Dermatology
BENJAMIN HIGHSTEIN.	Instructor in Dermatology
V. HARWOOD LINK.	Assistant in Dermatology

The third year class receives six lecture-demonstrations on the principles of dermatology by Dr. Robinson.

The senior course consists of demonstrations of the common skin diseases and venereal diseases given throughout the year by Dr. Robinson and staff. A weekly lecture-demonstration is given to the whole senior class by Dr. Robinson and Dr. Ellis.

Daily demonstrations and conferences are carried on by the out-patient staff in the dermatologic clinic involving both skin diseases and venereal diseases.

Third year.....	15 hours
Fourth Year.....	49 hours
Total.....	<u>64 hours</u>

ORTHOPAEDIC SURGERY

ALLEN FISKE VOSHELL.....	Professor of Orthopaedic Surgery
COMPTON RIELY.....	Clinical Professor of Orthopaedic Surgery
MOSES GELLMAN.....	Associate Professor of Orthopaedic Surgery
HARRY L. ROGERS.....	Associate Professor of Orthopaedic Surgery
HENRY F. ULLRICH.....	Associate Professor of Orthopaedic Surgery
I. H. MASERITZ.....	Instructor in Orthopaedic Surgery
MILTON J. WILDER.....	Instructor in Orthopaedic Surgery
JOHN V. HOPKINS.....	Assistant in Orthopaedic Surgery
*JASON H. GASKEL.....	Assistant in Orthopaedic Surgery

Didactic, clinical, bedside and out-patient instruction is given to the fourth year at the University and Mercy Hospitals and Dispensaries, Kernan Hospital for Crippled Children at Dickeyville and Baltimore City Hospitals. Instruction is also given to the third year in small groups at the Baltimore City Hospitals.

Weekly lectures throughout the year present all phases of orthopaedic surgery except fractures; brief discussions and demonstrations of physical therapy are included.

Fourth year groups are given more intimate instruction biweekly at one of the above institutions; fracture cases are included here.

Third year.....	60 hours
Fourth year.....	90 hours
Total.....	<u>150 hours</u>

RHINOLOGY AND LARYNGOLOGY

EDWARD A. LOOPER.....	Professor of Rhinology and Laryngology
WAITMAN F. ZINN.....	Clinical Professor of Rhinology and Laryngology
FRANKLIN B. ANDERSON.....	Associate Professor of Rhinology and Laryngology
W. RAYMOND MCKENZIE.....	Associate in Rhinology and Laryngology
THOMAS R. O'ROURK.....	Associate in Rhinology and Laryngology
BENJAMIN S. RICH.....	Associate in Rhinology and Laryngology
FAYNE A. KAYSER.....	Instructor in Rhinology and Laryngology
THEODORE A. SCHWARTZ.....	Instructor in Rhinology and Laryngology

FREDERICK T. KYPER.....	Instructor in Rhinology and Laryngology
SAMUEL L. FOX.....	Instructor in Rhinology and Laryngology
WILLIAM C. HUMPHRIES.....	Assistant in Rhinology and Laryngology
JOHN H. HIRSCHFELD.....	Assistant in Rhinology and Laryngology
BENJAMIN H. ISAACS.....	Assistant in Rhinology and Laryngology

Third Year. Instruction to whole class is given in the common diseases of the nose and throat, attention being especially directed to infections of the accessory sinuses, the importance of focal infections in the etiology of general diseases and modern methods of diagnosis. Lectures illustrated by lantern slides are given one hour weekly for seven weeks by Dr. Looper.

Fourth Year. Dispensary instruction is given for one and one-half hours daily, to small sections at the University and the Mercy Hospitals. The student is afforded an opportunity to study, diagnose and treat patients under supervision. Ward classes and clinical demonstrations are given in periods of one and one-half hours weekly throughout the session in the University and the Mercy Hospitals.

The Looper Clinic for bronchoscopy and esophagoscopy, recently established in the University Hospital, affords unusual opportunities for students to study diseases of the larynx, bronchi and esophagus. The clinic is open to students daily from 2 to 4 P.M. under direction of Dr. Looper.

The Mercy Hospital clinic for bronchoscopy and esophagoscopy is under the direction of Dr. Zinn. In these two clinics the etiology, symptomatology, diagnosis and treatment of foreign bodies in the air and food passages, as well as bronchoscopy, are taught to students as an aid in the diagnosis and treatment of diseases of the lungs.

Third year.....	9 hours
Fourth year.....	53 hours
Total.....	62 hours

GENITO-URINARY SURGERY

W. HOUSTON TOULSON.....	Professor of Genito-Urinary Surgery
KENNETH D. LEGGE.....	Professor of Clinical Genito-Urinary Surgery
HOWARD B. MAYS.....	Assistant Professor of Genito-Urinary Surgery
FRANCIS W. GILLIS.....	Assistant Professor of Genito-Urinary Surgery
AUSTIN H. WOOD.....	Associate in Genito-Urinary Surgery
LYLE J. MILLAN.....	Associate in Genito Urinary Surgery
L. K. FARGO.....	Associate in Genito-Urinary Surgery
JOHN F. HOGAN.....	Associate in Genito-Urinary Surgery
W. A. H. COUNCILL.....	Associate in Genito-Urinary Surgery
HUGH JEWETT.....	Assistant in Genito-Urinary Surgery
MORRIS A. FINE.....	Assistant in Genito-Urinary Surgery

Third Year. This course is given for seven hours to the whole class. It consists of lectures and demonstrations, including the use of lantern slides and motion pictures. Dr. Toulson.

Fourth Year. The course in this year includes explanations and demonstrations of urethroscopy, cystoscopy, ureteral catheterization, renal function tests, urog-

raphy, urine cultures and the various laboratory procedures. The teaching consists of clinics and ward rounds to small groups, and attendance by members of the senior class upon the out-patients in the dispensary. The student here is placed much on his own responsibility in arriving at a diagnosis. Members of the staff are in constant attendance for consultations. These dispensary classes are conducted at both the Mercy and University Hospitals where practically every variety of urogenital disease is seen and used for teaching purposes.

Third year.....	8 hours
Fourth year.....	64 hours
Total.....	72 hours

PROCTOLOGY

CHARLES F. BLAKE.....	Professor of Proctology
MONTÉ EDWARDS.....	Clinical Professor of Proctology
THURSTON R. ADAMS.....	Assistant Professor of Proctology
SIMON H. BRAGER.....	Associate in Proctology

Third Year. Seven lectures are given to the whole class. This course is for instruction in the diseases of the colon, sigmoid flexure, rectum and anus, and covers the essential features of the anatomy and physiology of the large intestine as well as the various diseases to which it is subject. Dr. Adams.

Fourth Year. Ward and dispensary instruction is given in the University and Mercy Hospitals, where different phases of the various diseases are taught by direct observation and examination. The use of the proctoscope and sigmoidoscope in the examination of the rectum and sigmoid is made familiar to each student. Mercy Hospital—Drs. Blake and Brager. University Hospital—Dr. Adams.

Third year.....	7 hours
Fourth year.....	16 hours
Total.....	23 hours

OTOLOGY

THOMAS R. O'ROURK.....	Clinical Professor of Otology
FRANKLIN B. ANDERSON.....	Associate Professor of Otology
BENJAMIN S. RICH.....	Associate in Otology
WILLIAM A. PARR.....	Instructor in Otology
FREDERICK T. KYPER.....	Instructor in Otology
SAMUEL L. FOX.....	Instructor in Otology

The course in otology is planned to give a practical knowledge of the anatomy and physiology of the ear, and its proximity and relationship to the brain and other vital structures. The inflammatory diseases, their etiology, diagnosis, treatment and complications are particularly stressed, with emphasis upon their relationship to the diseases of children, head-surgery and neurology.

Third Year. The whole class is given instruction by means of talks, anatomical specimens and lantern slides.

Fourth Year. Small sections of the class receive instruction and make personal examinations of patients under the direction of an instructor. The student is urged to make a routine examination of the ear in his ward work in general medicine and surgery.

Third year.....	12 hours
Fourth year.....	40 hours
Total.....	52 hours

NEUROLOGICAL SURGERY

CHARLES BAGLEY, JR.....	Professor of Neurological Surgery
RICHARD G. COBLENTZ.....	Clinical Professor of Neurological Surgery
JAMES G. ARNOLD, JR.....	Associate Professor of Neurological Surgery
JOHN A. WAGNER.....	Hitchcock Fellow and Instructor in Neurological Surgery
LOUIS O. J. MANGANIELLO.....	Fellow in Neurological Surgery

Third Year. The course covers instruction in diagnosis and treatment of surgical conditions of the brain, spinal cord and the peripheral nerves. Drs. Bagley, Coblentz and Arnold.

Fourth Year. Weekly ward rounds and conferences are given at the University Hospital. Drs. Bagley, Coblentz and Arnold.

Third year.....	12 hours
Fourth year.....	30 hours
Total.....	42 hours

ONCOLOGY

J. MASON HUNDLEY, JR.....	Professor of Gynecology
GRANT E. WARD.....	Associate Professor of Surgery
BEVERLEY C. COMPTON.....	Associate in Gynecology
JOHN C. DUMLER.....	Associate in Gynecology
E. EUGENE COVINGTON.....	Associate in Surgery
ARTHUR G. SIWINSKI.....	Associate in Surgery
J. DUER MOORES.....	Instructor in Surgery
ERNEST I. CORNBROOKS, JR.....	Instructor in Gynecology
WILLIAM K. DIERL.....	Instructor in Gynecology
EVERETT S. DIGGS.....	Assistant in Gynecology
JOHN O. ROBBEN.....	National Cancer Institute Fellow

The purpose of the courses in Oncology is to give students training in the diagnosis and treatment of neoplastic diseases not obtained in other departments and at the same time to correlate this training with that received in surgery, medicine, roentgenology and other specialties.

Third Year: An out-patient clinic is held twice weekly, which affords an opportunity for instruction in small groups of students assigned in rotation from the general surgical and gynecological sections. The gynecological problems are under the supervision of Dr. Hundley and the general surgical conditions are under the direction of Dr. Ward.

In addition to dispensary work, five lectures in general oncology are given by Dr. Ward to the entire class at the end of the year. The increasing impor-

tance of the cancer problem throughout the State, Nation and civilized world is emphasized. An introduction to the history, physics and practical application of radium is given. The diagnosis and treatment, both surgical and radiological, of neoplasms of the head and neck, oral cavity, skin, breasts and hemopoietic system are also covered.

Fourth Year: Each ward class meets for one and one-half hours once a week for five weeks with Dr. Ward and staff for demonstration and discussion of patients with neoplastic diseases.

Dr. Hundley and staff give instructions in the diagnosis and treatment of cancer of the generative organs during the regular gynecological courses in addition to the above mentioned dispensary instruction.

Third year.....	8 hours
Fourth year.....	16 hours
Total.....	24 hours

DENTISTRY

¹ BRICE M. DORSEY.....	Professor of Oral Surgery
HARRY M. ROBINSON, SR.....	Professor of Dermatology
¹ VERNON D. KAUFMAN.....	Associate Professor of Oral Surgery
¹ J. HERBERT WILKERSON.....	Associate Professor of Oral Surgery
¹ EDWARD C. DOBBS.....	Associate Professor of Pharmacology
GRANT E. WARD.....	Associate Professor of Oral Surgery
GEORGE McLEAN.....	Assistant Professor of Medicine
¹ CARL E. BAILEY.....	Instructor in Prosthetic Dentistry
¹ SAMUEL H. BRYANT.....	Instructor in Oral Diagnosis
¹ EUGENE L. PESSAGNO.....	Instructor in Operative Dentistry

¹ Faculty member, School of Dentistry.

This section has been reorganized for the teaching of both medical and dental students. There has been established a division in the out-patient department, and beds will be provided in the University Hospital, for the care of patients who will be available for the teaching of students from both schools.

Senior year: clinics weekly.

Ward instruction and group teaching are given. This includes diagnosis and treatment of diseases of the face, mouth and jaws.

INDUSTRIAL MEDICINE AND SURGERY

G. CARROLL LOCKARD.....	Professor of Clinical Medicine
CHARLES A. REIFSCHNEIDER.....	Clinical Professor of Traumatic Surgery
THURSTON R. ADAMS.....	Assistant Professor of Surgery

This section is under the combined supervision of the medical and surgical departments. It is a cooperative effort by members of the medical school and hospital staff to afford means for clinical and laboratory study of the patient who

has been subjected to traumatic or medical industrial hazard, so that adequate care may be instituted to promote his physical well-being. The facilities of the laboratories of the medical school and hospital are available as required.

Under direction of this department limited undergraduate instruction is given, especially in the methods of examination and of keeping records and in the general medico-legal principles as they affect the industrial employee, the employer, the general insurers, the physician and the hospital. There is also instruction on methods of making life insurance and other physical examinations, whether for employment or for health purposes. The wards of the University, Mercy and Baltimore City Hospitals provide for bed-side instruction.

Total hours: 48.

FIRST AID INSTRUCTION

Instruction consists of lectures combined with practical demonstrations and actual practice by students for one hour a week for ten weeks during the second semester of the Freshman Year.

PLASTIC SURGERY

EDWARD A. KITLOWSKI.....	Clinical Professor of Plastic Surgery
JOHN O. ROBBEN.....	Assistant in Plastic Surgery
CLARENCE P. SCARBOROUGH.....	Assistant in Plastic Surgery

This course is designed to acquaint students with the problems of reconstructive and plastic surgery. A subdivision in the dispensary has been established and beds for patients will be available for instruction in this course at the University and Baltimore City Hospitals and Kernan's Hospital for Crippled Children.

Third Year. Five lectures are given to the whole class. Dispensary instruction is provided on Mondays and Fridays.

Fourth Year. Ward rounds and operative demonstrations are held at the hospitals.

DEPARTMENT OF OBSTETRICS

LOUIS H. DOUGLASS.....	Professor of Obstetrics
J. McFARLAND BERGLAND.....	Associate Professor of Obstetrics
EMIL NOVAK.....	Associate Professor of Obstetrics
J. G. M. REESE.....	Associate Professor of Obstetrics
M. ALEXANDER NOVEY.....	Assistant Professor of Obstetrics
ISADORE A. SIEGEL.....	Assistant Professor of Obstetrics
JOHN E. SAVAGE.....	Assistant Professor of Obstetrics
MARGARET B. BALLARD.....	Associate in Obstetrics
DUDLEY P. BOWE.....	Associate in Obstetrics
HUGH B. McNALLY.....	Associate in Obstetrics
D. McCLELLAND DIXON.....	Associate in Obstetrics
D. FRANK KALTREIDER.....	Associate in Obstetrics
FRANK K. MORRIS.....	Instructor in Obstetrics
KENNETH B. BOYD.....	Assistant in Obstetrics
THOMAS S. BOWYER.....	Assistant in Obstetrics

JAROSLAV HULLA.....	Assistant in Obstetrics
MAXWELL L. MAZER.....	Assistant in Obstetrics
JACOB R. JENSEN.....	Assistant in Obstetrics
J. WARREN ALBRITAIN.....	Assistant in Obstetrics
W. KENNETH MANSFIELD, JR.....	Assistant in Obstetrics
GEORGE H. DAVIS.....	Assistant in Obstetrics
CHARLES H. DOELLER, JR.....	Assistant in Obstetrics
J. KING B. E. SEEGAR, JR.....	Assistant in Obstetrics
*SCHUYLER G. KOHN.....	Assistant in Obstetrics
JOHN H. MORRISON.....	Assistant in Obstetrics
OSCAR HARTMAN.....	Assistant in Obstetrics
MELVIN D. KAPPELMAN.....	Assistant in Obstetrics
JONES B. BALLINA.....	Assistant in Obstetrics
WILLIAM A. MITCHELL.....	Assistant in Obstetrics
T. EDGIE RUSSELL.....	Assistant in Obstetrics
IRVIN P. KLEMKOWSKI.....	Assistant in Obstetrics

Third Year. The lectures and recitations consisting of three hours' teaching weekly are designed to cover the anatomy of the female generative tract and the bony pelvis, the physiology and development of the ovum and the physiology of pregnancy and labor. Following this the pathology of pregnancy, labor and the puerperium are taken up. Drs. Douglass, Novak, Reese, Siegel and Savage.

Each student spends time during his junior year at the Baltimore City Hospitals observing, assisting and finally delivering patients under strict supervision. Each student sees about twenty deliveries there, and does a considerable amount of the routine work.

The junior students are assigned as assistants to the seniors in the home delivery service and accompany them on deliveries.

Each student receives, in small groups, ten hours of instruction in palpation of patients and mensuration of the pelvis and demonstrations of the mechanism of labor. Drs. Siegel and McNally.

Fourth Year. At the weekly clinical conference, cases are presented and discussed and the student body is encouraged to offer opinions and to ask questions. There is no didactic teaching done, and an earnest effort is made to keep it, in every sense of the word, a conference. Dr. Douglass.

The ward classes are held twice weekly for five weeks for each group. Various subjects are assigned and discussed, patients and their histories are presented. Drs. Reese, Novey, Savage and McNally.

Manikin instruction is given once a week. Drs. Dixon, Kaltreider and Doeller.

During the same five-week period, the students are sent into patients' homes to conduct deliveries under supervision of a senior member of the house staff and with the assistance of a graduate nurse. The student is held responsible for the complete conduct of each assigned case.

Each student spends thirty hours in the prenatal clinic, taking histories and examining patients under supervision.

Finally, the students are invited to attend the monthly meetings of The Committee on Maternal Mortality, where all maternal deaths occurring in Baltimore are openly discussed. *Hours*—Third year—148; Fourth year—102; total—250.

DEPARTMENT OF GYNECOLOGY

J. MASON HUNDLEY, JR.	Professor of Gynecology
THOMAS K. GALVIN	Clinical Professor of Gynecology
LEO BRADY	Assistant Professor of Gynecology
EDWARD P. SMITH	Assistant Professor of Gynecology
JOHN T. HIBBITTS	Associate in Gynecology
KENNETH B. BOYD	Associate in Gynecology
JOHN C. DUMLER	Associate in Gynecology
BEVERLEY C. COMPTON	Associate in Gynecology
HOUSTON EVERETT	Associate in Gynecology
J. J. ERWIN	Associate in Gynecology
FRANK K. MORRIS	Associate in Gynecology
ERNEST I. CORNBROOKS, JR.	Instructor in Gynecology
EVERETT S. DIGGS	Instructor in Gynecology
WILLIAM K. DIEHL	Instructor in Gynecology
THOMAS S. BOWYER	Instructor in Gynecology
ERNEST S. EDLOW	Instructor in Gynecology
W. ALLEN DECKERT	Instructor in Gynecology
H. L. GRANOFF	Assistant in Gynecology
HELEN I. MACINNIS	Assistant in Gynecology
ROLAND E. BIEREN	Assistant in Gynecology
CHARLES H. DOELLER, JR.	Assistant in Gynecology
WILLIAM A. DODD	Assistant in Gynecology
*JOHN S. HAUGHT	Assistant in Gynecology
HARRY MCB. BECK	Assistant in Gynecology
CHARLES B. MAREK	Assistant in Gynecology
WILLIAM C. DUFFY	Assistant in Gynecology
JOSEPH C. SHEEHAN	Assistant in Gynecology
WILLIAM J. RYSANEK	Assistant in Gynecology
HARRY F. KANE	Assistant in Gynecology
ROBERT B. TUNNEY	Assistant in Gynecology

Third Year. A course of thirty lectures and recitations is given to the whole class. In addition, a short course of lecture-demonstrations is given at the Baltimore City Hospitals, consisting of eight periods of one hour each, in which small groups of students are instructed in the fundamentals of gynecological diagnosis and examination.

Fourth Year. Operative clinics—lectures and demonstrations—are given six hours per week, for five weeks, to sections of the class.

Instruction in female urology is given. A small number of students may attend the cystoscopic dispensary which is held twice weekly.

The course in gynecology also includes instruction in the diagnosis and treatment of cancer of the generative organs. Small groups of students attend the oncological dispensary for additional work.

Third year	38 hours
Fourth year	74 hours
Total	112 hours

DEPARTMENT OF OPHTHALMOLOGY

CLYDE A. CLAPP.....	Professor of Ophthalmology
H. K. FLECK.....	Clinical Professor of Ophthalmology
HENRY F. GRAFF.....	Clinical Professor of Ophthalmology
JONAS FRIEDENWALD.....	Lecturer in Ophthalmic Pathology
JOSEPH I. KEMLER.....	Associate in Ophthalmology
F. EDWIN KNOWLES, JR.....	Associate in Ophthalmology
F. A. HOLDEN.....	Instructor in Ophthalmology
MILTON C. LANG.....	Instructor in Ophthalmology
A. KREMEN.....	Instructor in Ophthalmology
JEROME SNYDER.....	Assistant in Ophthalmology
FREDERICK M. REESE.....	Assistant in Ophthalmology

Third Year. Second semester. Dr. Graff reviews the anatomy and physiology of the eye and discusses the methods used in making the various examinations. Errors of refraction and their effect upon the general system are explained. Weekly section work, demonstrating the use of the ophthalmoscope, is carried on during the entire session.

Fourth Year. Clinics and demonstrations are given in diseases of the eye, weekly, for one year. Dr. Clapp.

This course consists of lectures upon the diseases of the eye, with particular reference to their diagnosis and relation to general medicine. Special lectures will be given upon vascular changes in the eye and upon the pathology of the eye. Some operations will be demonstrated by motion pictures.

Weekly ward classes are held at the University, The Baltimore Eye, Ear and Throat and Mercy Hospitals during which the eye grounds in the various medical and surgical conditions are demonstrated. Also daily demonstrations are given in the taking of histories and the diagnosis and treatment of the various conditions as seen in the dispensary. Drs. Kemler, Graff and Knowles.

Third year.....	20 hours
Fourth year.....	<u>164</u> hours
Total.....	184 hours

DEPARTMENT OF ROENTGENOLOGY

WALTER L. KILBY.....	Professor of Roentgenology
CHARLES N. DAVIDSON.....	Associate Professor of Roentgenology
ASA D. YOUNG.....	Assistant Professor of Roentgenology
STANLEY H. MACHT.....	Assistant Professor of Roentgenology
DONALD J. BARNETT.....	Assistant in Roentgenology

During the academic year small groups of the fourth year class are given weekly instruction in the diagnostic and therapeutic uses of the Roentgen rays. An effort is made to familiarize the student with the indications for and limitations of Roentgen ray examinations. The history, physics and practical application of Roentgen rays are alluded to but not stressed. Conferences are held with the various departments during the school year which are also open to members of the fourth year class.

Total hours: 25.

DEPARTMENT OF ANAESTHESIOLOGY

FREDERICK C. DYE.....Associate Professor of Anaesthesiology

THIRD YEAR

Lectures are given on the general physiology and pharmacology of anesthesia, with consideration of the special physiology and pharmacology of each anaesthetic agent. The methods of induction and administration of anaesthesia are discussed. The factors influencing the selection of the anaesthetic are emphasized, and the preparation and care of the anaesthetized patient are carefully explained.

These lectures are correlated with practical demonstrations, supplemented by lantern slides and motion pictures, at the University Hospital.

FOURTH YEAR

Each senior student is required to spend two hours daily for two weeks observing and administering anaesthetics in the operating suite.

Third year.....	10 hours
Fourth year.....	24 hours
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Total.....	34 hours

HISTORY OF MEDICINE

LOUIS A. M. KRAUSE Associate Professor of Medicine

Beginning with the spring of 1942 a group of lectures on the history of medicine has been presented on selected phases and trends of the development of medical knowledge and practice. It is planned to avoid duplication of subject matter for at least four years.

These lectures are offered primarily for our students, but a cordial invitation is extended to anyone who may wish to attend.

Announcement of the lectures will be made by mail and on the bulletin board of the School of Medicine.

ART AS APPLIED TO MEDICINE

CARL DAME CLARKE Associate Professor of Art as Applied to Medicine

This department is maintained for the purpose of supplying pictorial and plastic illustrations for visual teaching in the classrooms of the medical school and for publication in scientific periodicals.

Special courses of instruction are given to qualified students.

FIRST YEAR SCHEDULE **FIRST SEMESTER, SEPTEMBER 5, 1946 TO JANUARY 25, 1947**

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9.00 to 12.00	*Histology and Embryology 11-12 lecture <i>Bressler 2</i>		Orientation (Sept. 11-25) <i>Adm. 1</i>	*Histology and Embryology 11-12 lecture <i>Bressler 2</i>		Gross Anatomy
12.00 to 1.00	Lunch					
1.00 to 5.00	Gross Anatomy Lectures <i>A.H.</i> (1-2) Daily and Laboratories <i>Bressler 1</i> (2-5) Daily					

* Course ends January 11, 1947.

SECOND SEMESTER, JANUARY 27 TO JUNE 7, 1947

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9.00 to 12.00	Laboratory —	Laboratory —	Laboratory —	Laboratory —	Neuro-Anatomy Laboratory	Neuro-Anatomy Laboratory
12.00 to 1.00	Biol. Chem. Sect. A	Biol. Chem. Sect. B	Biol. Chem. Sect. A	Biol. Chem. Sect. B	Lecture—11-12 Br. 2	Lecture—11-12 Br. 2
1.00 to 2.00	Biol. Chem. <i>Adm. 1</i>	Biol. Chem. <i>Adm. 1</i>	Biol. Chem. <i>Adm. 1</i>	Biol. Chem. <i>Adm. 1</i>	Biol. Chem. <i>Adm. 1</i>	
2.00 to 3.00	Neuro- Physiology <i>Bressler 2</i>	Neuro- Physiology <i>Bressler 2</i>	Biol. Chem. Conference <i>Adm. 1</i>	Gross Anatomy <i>Adm. 1</i>	Biol. Chem. Conference <i>Adm. 1</i>	
3.00 to 5.00		Gross Anatomy <i>Adm. 1</i> Feb. 11 to Apr. 1	Psychiatry (3-5) <i>C. H.</i>	Feb. 13 to Apr. 10 — Neuro-Anatomy Apr. 17 Laboratory	(3-4) First Aid <i>C. H.</i> January 31 to April 4	

Locations of Lecture Halls and Laboratories:

Adm. 1—First Floor, Administration Building, Lombard and Greene Streets.
A. H.—Anatomical Hall—Upper Hall, N. E. Cor. Lombard and Greene Streets.
C. H.—Chemical Hall, Lower Hall, N. E. Cor. Lombard and Greene Streets.
Biological Chemistry Laboratory—Third Floor, 31 South Greene Street.
Bressler Research Laboratory—29 S. Greene Street.

Gross Anatomy—First Floor.

Histology and Embryology—Second Floor.

Neuro-anatomy—Second Floor.

Mid-Year Examinations—January 20-25, 1947

Final Examinations—June 2-6, 1947

SECOND YEAR SCHEDULE

FIRST SEMESTER, SEPTEMBER 5, 1946 TO JANUARY 25, 1947

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8.30 9.30	Physiology <i>Bressler 2</i>	Physiology <i>Bressler 2</i>	Medicine <i>Bressler 2</i>	Physiology <i>Bressler 2</i>	Physiology <i>Bressler 2</i>	Psychiatry (9-11) <i>Adm. 1</i>
9.30 to 10.30	Physiology Conference <i>Bressler 2</i>	Bacteriology <i>Adm. 1</i>	Physiology <i>Bressler 2</i>	Pharmacology <i>Bressler 2</i>	Pharmacology <i>Bressler 2</i>	
10.30 to 12.30	†Bacteriology Laboratory				Neurological Diagnosis <i>C. H.</i>	
12.30	Lunch					
1.00 to 5.00	Pharm. Lect. (1-2) <i>Bressler 2</i> Pharmacology <i>B</i> Physiology <i>A</i>	Laboratory <i>A</i> Laboratory <i>B</i>		Pharmacology <i>B</i> Physiology <i>A</i>	Laboratory (1 to 4) <i>A</i> Laboratory <i>B</i>	

† Bacteriology Laboratory—Section work during the last month.

SECOND SEMESTER, JANUARY 27 TO JUNE 7, 1947

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8.30 to 9.30	Surgery <i>Bressler 2</i>	Surgery <i>Bressler 2</i>	Surgical Anatomy <i>Bressler 2</i>	Medical Clinic <i>Amp.</i>	Physical Diagnosis <i>Adm. 1</i> 7 lectures	
9.30 to 10.30	Pharmacology <i>Bressler 2</i>	Pharmacology <i>Bressler 2</i>	Surgical Anatomy Laboratory		Pharmacology <i>Bressler 2</i>	
10.30 to 11.30	Pathology <i>C. H.</i>	Pathology <i>C. H.</i>	<i>Bressler 1</i>	Pathology <i>C. H.</i>	Pathology <i>C. H.</i>	
11.30	Lunch					
12.00 to 2.00	Pathology Laboratory	Pathology Laboratory	Immunology	Pathology Laboratory	Pathology Laboratory	
2.00 to 3.00	Surgical Anatomy <i>Adm. 1</i>	Immunology	Laboratory	Pharmacology Laboratory <i>Sect. A</i>	Pharmacology Laboratory <i>Sect. B</i>	
3.00 to 5.00	Surgical Anatomy Laboratory <i>Bressler 1</i>		Optional period Pathology Immunology	Physical Diagnosis <i>Sect. B</i> (3.00-5.00) <i>U. H. D.</i>	Physical Diagnosis <i>Sect. A</i> (3.00-5.00) <i>U. H. D.</i>	

‡ Immunology Laboratory—Section work during last two months.

Locations of Lecture Halls and Laboratories:

Adm. 1—First floor, Administration Building, Lombard and Greene Streets.

C. H.—Chemical Hall, Lower Hall, Lombard and Greene Streets.

Amp.—Wilson Memorial Amphitheatre, New University Hospital, Greene and Redwood Streets, Eighth Floor.

U. H. D.—University Hospital Dispensary, Old Hospital Building.

Laboratories:

Physiology, Pharmacology, Surgical Anatomy—Bressler Building.

Bacteriology, Immunology, Pathology, Second Floor, 31 S. Greene Street.

Mid-Year Examinations—January 20-25, 1947

Final Examinations—June 2-6, 1947

THIRD YEAR SCHEDULE SEPTEMBER 5, 1946 TO JUNE 7, 1947

SCHEDULE 1

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8.30 to 9.20	(Whole Class) Obstetrics C. H. †Gynecology Mar. 31 to May 19	(Whole Class) Surgery C. H.	(Whole Class) Obstetrics C. H. †Gynecology Apr. 2 to May 21	(Whole Class) Surgery C. H.	(Whole Class) Pathology C. H.	(Whole Class) Surgery C. H. †Anaesthesiology Mar. 22 to May 24
9.20 to 10.00	Transfer to Baltimore City Hospitals					
10.00 to 12.00	Physical Diagnosis, Pathology, Neurology and Pediatrics at B. C. H.					
12.00 to 1.00	Transfer and Lunch	Transfer and Lunch	Lunch	Transfer and Lunch	Lunch	
1.00 to 2.00	(Whole Class) Otolaryngology, Nose & Throat, Urology, Proctology, Plastic Surgery C. H.	(Whole Class) *Gynecology †Eye—10 wks. Jan. 28 to Apr. 1 †Oncology —5 wks. Apr. 15 to May 13 C. H.	Medical Clinic B. C. H.	(Whole Class) Clinical Pathology Bressler 2	Obstetrical Clinic B. C. H.	
2.00 to 4.00	(Whole Class) Pathology Laboratory 31		Surgery — Pediatrics B. C. H.	(Whole Class) Clinical Pathology	Surgery — Pediatrics B. C. H.	
4.00 to 5.00	(Whole Class) *Physical Diagnosis, †Psychiatry, †Legal Medicine C. H.	(Whole Class) Hygiene and Public Health C. H.	Orthopaedics Roentgenology B. C. H.	— Laboratory Bressler 5	Orthopaedics B. C. H.	

* First Semester.

† Second Semester.

THIRD YEAR SCHEDULE

SEPTEMBER 5, 1946 TO JUNE 7, 1947

SCHEDULE 2

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8.30 to 9.20	(Whole Class) Obstetrics C. H. †Gynecology Mar. 31 to May 19	(Whole Class) Surgery C. H.	(Whole Class) Obstetrics C. H. †Gynecology Apr. 2 to May 21	(Whole Class) Surgery C. H.	(Whole Class) Pathology C. H.	(Whole Class) Surgery C. H. Anaesthesiology Mar. 22 to May 24
9.20 to 10.20	Pediatrics C. H.	*Medicine C. H.	*Medicine C. H.	*Therapeutics C. H.	*Medicine C. H.	Neurology C. H.
10.30 to 12.30	Operative Surgery—Bressler 6 Medical and Surgical Dispensaries—(Univ. and Mercy Sections)					
12.30 to 1.00	Lunch					
1.00 to 2.00	Same as Schedule 1	Medical Clinic Amp. Ophthalmoscopy (5 weeks) B. E. H. — Obstetrics (5 weeks) Univ. Hosp. Disp. — Otolgoy (5 wks.) Univ. Hosp. 3-C	Same as Schedule 1	Psychiatry Dermatology U. H. Disp.	Obstetrics Br. 2	
2.00 to 4.00						
4.00 to 5.00						

* Pediatrics, May 13-23

The Junior Class will be divided into two sections—A and B. Each section reports to classes in keeping with the following schedule assignment, in which the letters represent the class sections and the numerals indicate the schedules to be followed for the periods shown.

Schedule Assignment

Periods	Sections and Schedules
September 5, 1946 to January 25, 1947.....	A-1, B-2
January 27 to May 24, 1947.....	B-1, A-2

Locations of Lecture Halls, etc.

A. H.—Anatomical Hall, Upper Hall, N. E. Cor. Lombard and Greene Streets.
 Amp.—Wilson Memorial Amphitheatre, New University Hospital, Eighth Floor.
 B. C. H.—Baltimore City Hosps., 4940 Eastern Ave.
 B. E. H.—Baltimore Eye, Ear and Throat Hospital, 1214 Eutaw Place.
 Bressler—Bressler Building, 29 S. Greene Street.
 C. H.—Chemical Hall, Lower Hall, N. E. Cor. Lombard and Greene Streets.
 Univ. Hosp.—New University Hospital, Greene and Redwood Streets.
 U. H. Disp.—Old Hospital Building, S. W. Cor. Lombard and Greene Streets.
 31—31 South Greene Street.
 Clinical Pathology Laboratory—Fifth Floor, Bressler Building.
 Pathology Laboratory—31 South Greene Street, Special Rooms, Basement.

Mid-Year Examinations—January 20-25, 1947

Final Examinations—May 26 to June 6, 1947

FOURTH YEAR SCHEDULE
SEPTEMBER 5, 1946 TO JUNE 7, 1947
MERCY SECTION

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
9.00 to 10.00	Clinical Clerkships	Surgical Pathology or Chest Surgery Room 34	Clinical Pathological Conference Room 34	Surgical Clinic Room 34	Medical Clinic Room 34	Pediatric Clinic Room 34	
10.00 to 12.00	Medical Ward Work	Medical Ward Work	Medical Ward Work	Medical Ward Work	Medical Ward Work	Medical Ward Work	<i>Medical Section</i>
	Medical Dispensary	Medical Dispensary	Medical Dispensary	Medical Dispensary	Medical Dispensary	Medical Dispensary	
	Group A	Group B	Group A	Group B	Group A	Group B	
	Surgical Ward Work	Surgical Ward Work	Surgical Ward Work	Surgical Ward Work	Surgical Ward Work	Surgical Ward Work	<i>Surgical Section</i>
12.00 to 2.00	*Pediatrics	Gynecology *Pediatrics	*Pediatrics	Gynecology *Pediatrics	*Pediatrics	*Pediatrics	<i>Special Section</i>
	Lunch, Dispensary	Lunch, Dispensary	Lunch, Dispensary	Lunch, Dispensary	Lunch, Dispensary	(12-1) Orthopaedic Clinic Room 34	
	Neurology	G.I.	Neurology	G.I.	Neurology		Medical A
	Orthopaedic	Dermatology	Orthopaedic	Dermatology	Orthopaedic		Medical B
	G.U.	G.U.	Follow up Surgical Clinic	G.U.	G.U.		Surgical A
	N. & T.	Proctology	N. & T.	Proctology	N. & T.		Surgical B
	Pediatrics (U.H.)		Pediatrics (U.H.)	Pediatrics (U.H.)	Pediatrics (U.H.)		Special A
	Pediatrics (U.H.)		Pediatrics (U.H.)	Pediatrics (U.H.)	Pediatrics (U.H.)		Special B
2.15 to 3.15	Dermatology Clinic 1st time Full Class <i>Amp.</i> thereafter University Dispensary	Neurology Clinic Room 34	Eye and Ear Clinic (Full Class at Univ. Hosp.) <i>Amp.</i>	Obstetrical Clinic (Full Class at Univ. Hosp.) <i>Amp.</i>	Hygiene and Public Health (Full Class at Univ. Hosp.) <i>Amp.</i>		
3.30 to 5.00	See Special Schedule	Medicine	G.I.	Medicine	Neurology		Medical Section
		Orthopaedics	N. & T.	Proctology	Roentgenology		Surgical Section
		Pediatrics	Public Health	Pediatrics (U.H.)	Psychiatry (U.H.)		Special Section

* Mercy special group, divided attendance at Univ. and Mercy.

University Sections on Medicine and Gynecology report at 8.30.

The Senior Class is divided into two sections, which report, one at Lombard and Greene Streets, the other at Calvert and Saratoga Streets for one semester each, then rotate.

Each section of the class is divided into three groups—Medical, Surgical, and Special. These groups will rotate on the following dates:

First Semester

1st period.....Sept. 5-Oct. 12

2nd period.....Oct. 14-Nov. 20

3rd period.....Nov. 21-Jan. 18

Second Semester

1st period.....Jan. 27-Mar. 1

2nd period.....Mar. 3-Apr. 5

3rd period.....Apr. 7-May 10

C.H.—Chemical Hall—N. E. Cor. Lombard and Greene Streets.
Amp.—Wilson Memorial Amphitheatre—New University Hospital
Room 34—Second floor, Calvert and Saratoga Streets.

Univ. Section Dispensary schedule posted in Old Hospital Bldg.

Mercy Section—Dispensary schedule at Mercy Hospital shown under Mercy Section, herewith.

Mid-Year Examinations—January 20-25, 1947

Final Examinations—May 12-17, 1947

UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE AND COLLEGE OF PHYSICIANS AND SURGEONS

GRADUATES, MARCH 22, 1946

- Amlicke, Jeanne Dorothy, B.S. New Jersey
 Arnold, Jesse Hoyt, Jr., A.B. Maryland
 Audet, Charles Henry, Jr. Connecticut
 Audet, Robert Joseph. Connecticut
 Bannen, William James, Jr., B.S. Pennsylvania
 Baner, Robert Edward, A.B. Maryland
 Benavent, Walter José, B.S. Puerto Rico
 Bonifant, Alfred Dement, B.S. Maryland
 Brosemer, Lowell Russell, B.S. California
 Brown, Eli Matthew, B.S. Maryland
 Brown, Robert Ray. West Virginia
 Buckner, Louise Paddon, B.S. Maryland
 Cano, Harold Vernon, B.S. New Jersey
 Carr, William Francis. Pennsylvania
 Christopher, Thomas West Massachusetts
 Clyman, Sidney Gary, B.S. Maryland
 Codd, Francis Ignatius. Maryland
 Cohn, Jerome Elias, A.B. Maryland
 Connor, Thomas Byrre, A.B. Maryland
 Cross, Richard Joseph, Jr., B.S. Maryland
 Crouch, Walter Lee. North Carolina
 D'Antonio, Joseph. Maryland
 Diaz-Carazo, José, B.S. Puerto Rico
 Driggs, Guy Kenneth. Arizona
 Eareckson, Vincent Osley, Jr., B.S. Maryland
 Earnhardt, Herman Lee, Jr., A.B. North Carolina
 Eavey, James Lee, B.S. Maryland
 Fischer, Joseph Samuel, A.B. Maryland
 Frye, Paul Eugene. Maryland
 Gaby, Samuel David, A.B. Maryland
 Gamble, John Reeves, Jr., A.B. North Carolina
 Gentry, William Daniel, Jr. Maryland
 Gerlach, James Johnson, A.B. Maryland
 Goetz, Abraham Aaron, A.B. New York
 Gray, Harry William, B.S. Maryland
 Greenfield, Duane Leonard, A.B. Maryland
 Hansen, Leland Jay. Utah
 Hardin, Henry Carter, Jr., A.B. Florida
 Harley, John Barker, B.S. Maryland
 Hawkins, Charles William. Tennessee
 Hefner, Charles Arthur. West Virginia
 Hendrickson, Edwin Okey, III. Maryland
 Hill, Harry Edward, B.S. Maryland
 Hunter, J. Poulson, B.S. Utah
 Hyman, Nathan Bernard. Maryland
 Jennings, Erwin Reeves, A.B. Georgia
 Kiel, August, Jr. Maryland
 Knapp, Harry Grove Robert North Dakota
 Knox, Lawrence Joseph, B.S. Maryland
 Latimer, John Howard. Utah
 Levickas, Herbert Joseph, B.S. Maryland
 Macht, Allan Harris, B.S. Maryland
 Maholick, Leonard Thomas, B.S. District of Columbia
 Markley, Raymond Law, Jr., A.B. Pennsylvania
 Marshall, Charles Benton, Jr. West Virginia
 Massenburg, George Yellott. Georgia
 Matthews, Otto Stevens. North Carolina
 May, Robert Eugene, A.B. Maryland
 McElfatrick, George Charles. Delaware
 McPherson, Thomas Cotesworth. Georgia
 McWilliams, Clarence Emanuel, Jr., A.B. Maryland
 Mintzer, Joseph Herman, B.S. New York
 Mitchell, John Armitage. Maryland
 Morrison, John Edward. Maryland
 Nataro, Jerome Paul, B.S. New Jersey
 Nichols, Pomeroy, Jr. North Carolina
 North, Ellsworth Howard, Jr., B.S. Maryland
 O'Hare, James Stewart, B.S. Maryland
 Orrison, William Werner, A.B. Maryland
 Osborne, Horace Henry. Georgia
 Owen, Arthur John. Maryland
 Park, William Favre. Maryland
 Paul, Earl Rupert. Maryland
 Peck, Clemmer Marcus, B.S. West Virginia
 Platt, Lois Irene, A.B. Maryland
 Rawlins, John Calvin, B.S. Delaware
 Reisch, Milton, B.S. Maryland
 Reiter, Ralph Alan. Maryland
 Riley, Robert Annan, Jr. Ohio
 Roberts, James Alwin, B.S. Maryland
 Rossberg, Robert Crittenden, B.S. Maryland
 Sacks, Sidney, B.S. Maryland
 Sewell, James Anderson. Florida
 Shallenberger, Frank Anthony, Jr., B.S. Maryland
 Sills, David Nicholson, Jr. Delaware
 Smith, Edward Milton, Jr., B.S. Maryland
 Smith, Edward Patrick, Jr. Maryland
 Stallard, Clinton Wolfe, Jr. West Virginia
 Swindell, Herbert Van Arden, B.S. Maryland
 Toby, Leon, A.B. Maryland
 Vaughn, James Anderson, Jr., A.B. Florida
 Weitzman, Elliott Lionel. Maryland
 Wentz, Irl Jesse, A.B. Pennsylvania
 Wolfe, Walter McIlhane, Jr. Maryland
 Workman, Joseph Berkeley, A.B. Maryland
 Young, Alexander William, Jr., B.S. West Virginia
 Young, Richard Atlee, A.B. Maryland

HONORS

UNIVERSITY PRIZE GOLD MEDAL

MILTON REISCH

CERTIFICATES OF HONOR

LEON TOBY

JEROME ELIAS COHN

JOSEPH HERMAN MINTZER

SAMUEL DAVID GABY

SIDNEY GARY CLYMAN

INTERNSHIPS—GRADUATES OF MARCH 22, 1946

April 1, 1946–June 30, 1947

Amlicke, Jeanne Dorothy.....	St. Mary's Hospital, Waterbury, Conn.
Arnold, Jesse Hoyt, Jr.....	Columbia Hospital, Milwaukee, Wisconsin
Audet, Charles Henry, Jr.....	St. Mary's Hospital, Waterbury, Conn.
Audet, Robert Joseph.....	St. Mary's Hospital, Waterbury, Conn.
Banne, William James, Jr....	University of Pittsburgh Medical Center, Pittsburgh, Pa.
Bauer, Robert Edward.....	University Hospital, Baltimore, Md.
Benavent, Walter José.....	St. Agnes' Hospital, Baltimore, Md.
Bonifant, Alfred Dement....	Central Dispensary & Emergency Hospital, Washington, D. C.
Brosemer, Lowell Russell.....	St. Luke's Hospital, San Francisco, Calif.
Brown, Eli Matthew.....	Jewish Hospital, Brooklyn, N. Y.
Brown, Robert Ray.....	Charleston General Hospital, Charleston, West Virginia
Buckner, Louise Paddon.....	Garfield Memorial Hospital Washington, D. C.
Cano, Harold Vernon.....	South Baltimore General Hospital, Baltimore, Md.
Carr, William Francis.....	Bon Secours Hospital, Baltimore, Md.
Christopher, Thomas West.....	Boston City Hospital, Boston, Mass.
Clyman, Sidney Gary.....	Morrisania City Hospital, New York, N. Y.
Codd, Francis Ignatius.....	United States Naval Hospital, Philadelphia, Pa.
Cohn, Jerome Elias.....	Highland-Alameda County Hospital, Oakland, Calif.
Connor, Thomas Byrne.....	Mercy Hospital, Baltimore, Md.
Crouch, Walter Lee.....	University Hospital, Baltimore, Md.
Cross, Richard Joseph, Jr.....	University Hospital, Baltimore, Md.
D'Antonio, Joseph.....	Church Home and Hospital, Baltimore, Md.
Diaz-Carazo, José.....	St. Joseph's Hospital, Baltimore, Md.
Driggs, Guy Kenneth.....	University Hospital, Baltimore, Md.
Eareckson, Vincent Offley, Jr....	South Baltimore General Hospital, Baltimore, Md.
Earnhardt, Herman L....	Medical College of Virginia, Hospital Division, Richmond, Va.
Eavey, James Lee.....	University Hospital, Baltimore, Md.
Fischer, Joseph Samuel.....	University Hospital, Baltimore, Md.
Frye, Paul Eugene.....	Baroness Erlanger Hospital, Chattanooga, Tenn.
Gaby, Samuel David.....	Sinai Hospital, Baltimore, Md.
Gamble, John Reeves, Jr.....	Charlotte Memorial Hospital, Charlotte, N. C.
Gentry, William Daniel, Jr.....	Mercy Hospital, Baltimore, Md.
Gerlach, James Johnson.....	Mercy Hospital, Baltimore, Md.
Goetz, Abraham Aaron.....	Jewish Hospital, Brooklyn, N. Y.
Gray, Harry William.....	Providence Hospital, Washington, D. C.
Greenfield, Duane Leonard.....	Cook County Hospital, Chicago, Ill.

Hansen, Leland Jay.....	California Hospital, Los Angeles, Calif.
Hardin, Henry Carter.....	Methodist Hospital, Brooklyn, N. Y.
Harley, John Barker.....	University Hospital, Baltimore, Md.
Hawkins, Charles William.....	University Hospital, Baltimore, Md.
Hefner, Charles Arthur.....	Youngstown Hospital Association, Youngstown, Ohio
Hendrickson, Edwin Okey, III.....	Union Memorial Hospital, Baltimore, Md.
Hill, Harry Edward.....	University Hospital, Baltimore, Md.
Hunter, John Poulson.....	University Hospitals, Iowa City, Iowa
Hyman, Nathan Bernard.....	Sinai Hospital, Baltimore, Md.
Jennings, Erwin Reeves.....	University Hospital, Baltimore, Md.
Kiel, August, Jr.....	Mercy Hospital, Baltimore, Md.
Knapp, Harry Grove Robert.....	Colorado General Hospital, Denver, Colorado
Knox, Lawrence Joseph.....	Mercy Hospital, Baltimore, Md.
Latimer, John Howard.....	St. Luke's Hospital, San Francisco, Calif.
Levickas, Herbert Joseph.....	St. Agnes' Hospital, Baltimore, Md.
Macht, Allan Harris.....	Sinai Hospital, Baltimore, Md.
Maholick, Leonard Thomas.....	Emory University Hospital, Emory University, Ga.
Markley, Raymond Law, Jr.....	Bon Secours Hospital, Baltimore, Md.
Marshall, Charles B., Jr.....	University Hospital, Baltimore, Md.
Massenburg, George Yellott.....	University Hospital, Baltimore, Md.
Matthews, Otto Stevens.....	Medical College of Virginia, Hospital Division, Richmond, Va.
May, Robert Eugene.....	Mercy Hospital, Baltimore, Md.
McElfatrick, George Charles.....	Church Home and Hospital, Baltimore, Md.
McPherson, Thomas Cotesworth.....	Johns Hopkins Hospital, Baltimore, Md.
McWilliams, Clarence E., Jr.....	Mercy Hospital, Baltimore, Md.
Mintzer, Joseph Herman.....	Queens General Hospital, Jamaica, Long Island, N. Y.
Mitchell, John Armitage.....	Maryland General Hospital, Baltimore, Md.
Morrison, John Edward.....	University Hospital, Baltimore, Md.
Nataro, Jerome Paul.....	St. Michael's Hospital, Newark, N. J.
Nichols, Pomeroy, Jr.....	University Hospital, Baltimore, Md.
North, Ellsworth Howard, Jr.....	Johns Hopkins Hospital, Baltimore, Md.
O'Hare, James Stewart.....	Mercy Hospital, Baltimore, Md.
Orrison, William Werner.....	Central Dispensary & Emergency Hospital, Washington, D. C.
Osborne, Horace Henry.....	San Bernardino County Charity Hospital, San Bernardino, Calif.
Owen, Arthur John.....	St. Joseph's Hospital, Baltimore, Md.
Park, William Favre.....	United States Naval Hospital, Great Lakes, Ill.
Paul, Earl Rupert.....	Mercy Hospital, Baltimore, Md.
Peck, Clemmer Marcus.....	York Hospital, York, Penna.
Platt, Lois Irene.....	Garfield Memorial Hospital, Washington, D. C.
Rawlins, John Calvin.....	Central Dispensary & Emergency Hospital, Washington, D. C.
Reisch, Milton.....	University Hospital, Baltimore, Md.
Reiter, Ralph Alan.....	United States Naval Hospital, Long Beach, Calif.
Riley, Robert Annan, Jr.....	Columbia Hospital, Milwaukee, Wisconsin
Roberts, James Alwin.....	Mercy Hospital, Baltimore, Md.
Rosberg, Robert Crittenden.....	University Hospital, Baltimore, Md.
Sacks, Sidney.....	Jewish Hospital, Brooklyn, N. Y.
Sewell, James Anderson.....	Baroness Erlanger Hospital, Chattanooga, Tenn.
Shallenberger, Frank A., Jr.....	University Hospital, Baltimore, Md.
Sills, David Nicholson, Jr.....	Mercy Hospital, Baltimore, Md.
Smith, Edward Milton, Jr.....	St. Agnes' Hospital, Baltimore, Md.

Smith, Edward Patrick, Jr.....	Mercy Hospital, Baltimore, Md.
Stallard, Clinton Wolfe, Jr.	
Collis P. and Howard Huntington Memorial Hospital, Pasadena, Calif.	
Swindell, Herbert VanArden.....	South Baltimore General Hospital, Baltimore, Md.
Toby, Leon.....	West Baltimore General Hospital, Baltimore, Md.
Vaughn, James Anderson, Jr.....	University Hospital, Baltimore, Md.
Weitzman, Elliott Lionel.....	Sinai Hospital, Baltimore, Md.
Wentz, Irl Jesse.....	Newark City Hospital, Newark, N. J.
Wolfe, Walter McIlhaney.....	Hospital for Women of Maryland, Baltimore, Md.
Workman, Joseph Berkeley.....	University Hospital, Baltimore, Md.
Young, Alexander William, Jr.....	Western Pennsylvania Hospital, Pittsburgh, Pa.
Young, Richard Atlee.....	St. Joseph's Hospital, Baltimore, Md.

MATRICULATES

SENIOR CLASS, JULY 19, 1945 TO MARCH 22, 1946

AMLICKE, JEANNE DOROTHY, B.S., <i>University of Maryland, 1943</i>	New Jersey
ARNOLD, JESSE HOYT, JR., A.B., <i>University of North Dakota, 1942</i>	Maryland
AUDET, CHARLES HENRY, JR., <i>University of Maryland</i>	Connecticut
AUDET, ROBERT JOSEPH, <i>University of Maryland</i>	Connecticut
BANNEN, WILLIAM JAMES, JR., B.S., <i>Belhany College, 1943</i>	Pennsylvania
BAUER, ROBERT EDWARD, A.B., <i>The Johns Hopkins University, 1943</i> ¹	Maryland
BENAVENT, WALTER JOSÉ, B.S., <i>University of Maryland, 1943</i>	Puerto Rico
BONIFANT, ALFRED DEMENT, B.S., <i>University of Maryland, 1943</i>	Maryland
BROSEMER, LOWELL RUSSELL, B.S., <i>University of California, 1942</i>	California
BROWN, ELI MATTHEW, B.S., <i>University of Maryland, 1944</i>	Maryland
BROWN, ROBERT RAY, <i>West Virginia University</i>	West Virginia
BUCKNER, LOUISE PADDON, B.S., <i>University of Maryland, 1943</i>	Maryland
CANO, HAROLD VERNON, B.S., <i>University of Maryland, 1944</i>	New Jersey
CARR, WILLIAM FRANCIS, Ml. St. Mary's College.....	Pennsylvania
CHRISTOPHER, THOMAS WEST, <i>Brown University</i>	Massachusetts
CLYMAN, SIDNEY GARY, B.S., <i>University of Maryland, 1944</i>	Maryland
CODD, FRANCIS IGNATIUS, <i>University of Maryland, 1944</i>	Maryland
COHN, JEROME ELIAS, A.B., <i>The Johns Hopkins University, 1943</i>	Maryland
CONNOR, THOMAS BYRNE, A.B., <i>Loyola College, 1943</i>	Maryland
CROSS, RICHARD JOSEPH, JR., B.S., Ml. St. Mary's College, 1943.....	Maryland
CROUCH, WALTER LEE, <i>University of North Carolina; University of North Carolina School of Medicine, March 1943-September 1944</i>	North Carolina
D'ANTONIO, JOSEPH, <i>Maryville College</i>	Maryland
DIAZ-CARAZO, JOSÉ, B.S., Ml. St. Mary's College, 1942.....	Puerto Rico
DRIGGS, GUY KENNETH, <i>University of Arizona</i>	Arizona
EARECKSON, VINCENT OFFLEY, JR., B.S., <i>University of Maryland, 1944</i>	Maryland
EARNHARDT, HERMAN LEE, JR., A.B., <i>Duke University, 1943; University of North Carolina School of Medicine, March 1943-September 1944</i>	North Carolina
EAVEY, JAMES LEE, B.S., <i>Franklin and Marshall College, 1943</i>	Maryland
FISCHER, JOSEPH SAMUEL, A.B., <i>The Johns Hopkins University, 1943</i>	Maryland
FISHER, GEORGE WILLIAM, B.S., <i>Franklin and Marshall College, 1943</i>	Maryland
FRYE, PAUL EUGENE, <i>University of Maryland</i>	Maryland
GABY, SAMUEL DAVID, A.B., <i>The Johns Hopkins University, 1943</i>	Maryland
GAMBLE, JOHN REEVES, JR., A.B., <i>Emory University, 1943</i>	North Carolina
GENTRY, WILLIAM DANIEL, JR., <i>University of Maryland</i>	Maryland
GERLACH, JAMES JOHNSON, A.B., <i>Colorado College, 1943</i>	Maryland
GOETZ, ABRAHAM AARON, A.B., <i>The Johns Hopkins University, 1944</i>	New York
GRAY, HARRY WILLIAM, B.S., <i>University of Maryland, 1944</i>	Maryland
GREENFIELD, DUANE LEONARD, A.B., <i>Sioux Falls College, 1939; M.A., Columbia University, 1940</i>	Maryland
HANSEN, LELAND JAY, <i>Utah State Agricultural College</i>	Utah
HARDIN, HENRY CARTER, JR., A.B., <i>Emory University, 1943</i>	Florida
HARLEY, JOHN BARKER, B.S., <i>Dickinson College, 1943</i>	Maryland
HAWKINS, CHARLES WILLIAM, <i>University of Chattanooga</i>	Tennessee
HEFNER, CHARLES ARTHUR, <i>West Virginia University</i>	West Virginia
HENDRICKSON, EDWIN OKEY, III, <i>The Johns Hopkins University</i>	Maryland
HILL, HARRY EDWARD, B.S., <i>University of Maryland, 1942</i>	Maryland
HUNTER, J. POULSON, B.S., <i>University of Utah, 1943</i>	Utah
HYMAN, NATHAN BERNARD, <i>The Johns Hopkins University</i>	Maryland
JENNINGS, ERWIN REEVES, A.B., <i>Emory University, 1943</i>	Georgia
KIEL, AUGUST, JR., <i>University of Maryland</i>	Maryland
KNAPP, HARRY GROVE ROBERT, <i>Colorado College</i>	North Dakota
KNOX, LAWRENCE JOSEPH, B.S., <i>University of Maryland, 1944</i>	Maryland
LATIMER, JOHN HOWARD, <i>University of Utah</i>	Utah
LEVICKAS, HERBERT JOSEPH, B.S., <i>University of Maryland, 1944</i>	Maryland
MACHT, ALLAN HARRIS, B.S., <i>University of Maryland, 1944</i>	Maryland
MAHOLICK, LEONARD THOMAS, B.S., <i>University of Maryland, 1944</i>	District of Columbia
MARKLEY, RAYMOND LAW, JR., A.B., <i>Gettysburg College, 1943</i>	Pennsylvania

¹ Did not complete the year.

MARSHALL, CHARLES BENTON, JR., <i>Ohio University</i>	West Virginia
MASSENBURG, GEORGE YELLOTT, <i>Duke University</i>	Georgia
MATTHEWS, OTTO STEVENS, <i>University of North Carolina; University of North Carolina School of Medicine, March 1943-September 1944</i>	North Carolina
MAY, ROBERT EUGENE, A.B., <i>Loyola College, 1942</i>	Maryland
McELPATRICK, GEORGE CHARLES, <i>Dartmouth College</i>	Delaware
McPHERSON, THOMAS COTESWORTH, <i>Emory University</i>	Georgia
McWILLIAMS, CLARENCE EMANUEL, JR., A.B., <i>Western Maryland College, 1943</i>	Maryland
MINTZER, JOSEPH HERMAN, B.S., <i>University of Maryland, 1943</i>	New York
MITCHELL, JOHN ARMITAGE, <i>Gettysburg College</i>	Maryland
MORRISON, JOHN EDWARD, <i>The Johns Hopkins University</i>	Maryland
NATARO, JEROME PAUL, B.S., <i>Selon Hall College, 1942</i>	New Jersey
NICHOLS, POMEROY, JR., <i>Emory University</i>	North Carolina
NORTH, ELLSWORTH HOWARD, JR., B.S., <i>University of Maryland, 1944</i>	Maryland
O'HARE, JAMES STEWART, B.S., <i>Loyola College, 1943</i>	Maryland
ORRISON, WILLIAM WERNER, A.B., <i>Western Maryland College, 1943</i>	Maryland
OSBORNE, HORACE HENRY, <i>University of Georgia</i>	Georgia
*OWEN, ARTHUR JOHN, A.B., <i>Loyola College, 1942</i>	Maryland
PARK, WILLIAM FAVRE, <i>University of Maryland</i>	Maryland
PAUL, EARL RUPERT, <i>University of Virginia</i>	Maryland
PECK, CLEMMER MARCUS, B.S., <i>Hampden-Sydney College, 1942</i>	West Virginia
PLATT, LOIS IRENE, A.B., <i>Goucher College, 1931</i>	Maryland
RAWLINS, JOHN CALVIN, B.S., <i>Western Maryland College, 1943</i>	Delaware
REISCH, MILTON, B.S., <i>University of Maryland, 1944</i>	Maryland
REITER, RALPH ALAN, <i>Bridgewater College</i>	Maryland
RILEY, ROBERT ANNAN, JR., <i>Emory University</i>	Ohio
ROBERTS, JAMES ALWIN, B.S., <i>University of Maryland, 1944</i>	Maryland
ROSSBERG, ROBERT CRITTENDEN, B.S., <i>University of Maryland, 1944</i>	Maryland
SACKS, SIDNEY, B.S., <i>University of Maryland, 1944</i>	Maryland
SEWELL, JAMES ANDERSON, <i>Emory University</i>	Florida
SHALLENBERGER, FRANK ANTHONY, JR., <i>Loyola College</i>	Maryland
SILLS, DAVID NICHOLSON, JR., <i>University of Maryland</i>	Delaware
SMITH, EDWARD MILTON, JR., B.S., <i>University of Maryland, 1944</i>	Maryland
SMITH, EDWARD PATRICK, JR., <i>University of Maryland</i>	Maryland
STALLARD, CLINTON WOLFE, JR., <i>West Virginia Institute of Technology</i>	West Virginia
SWINDELL, HERBERT VAN ARDEN, B.S., <i>University of Maryland, 1944</i>	Maryland
TOBY, LEON, A.B., <i>The Johns Hopkins University, 1943</i>	Maryland
VAUGHN, JAMES ANDERSON, JR., A.B., <i>Emory University, 1943</i>	Florida
WEITZMAN, ELLIOTT LIONEL, <i>The Johns Hopkins University</i>	Maryland
WENTZ, IRL JESSE, A.B., <i>Western Maryland College, 1942</i>	Pennsylvania
WOLFE, WALTER McILHANEY, JR., <i>Virginia Military Institute</i>	Maryland
WORKMAN, JOSEPH BERKELEY, A.B., <i>Western Maryland College, 1943</i>	Maryland
YOUNG, ALEXANDER WILLIAM, JR., B.S., <i>University of Maryland, 1944</i>	West Virginia
YOUNG, RICHARD ATLEE, A.B., <i>Gettysburg College, 1943</i>	Maryland

JUNIOR CLASS, JULY 19, 1945 TO MARCH 22, 1946

ABELL, HARRY DAVIS, <i>The Johns Hopkins University</i>	Kentucky
ALLEN, GLADYS MARTHA, B.S., <i>University of Maryland, 1943</i>	Maryland
ANTHONY, JAMES ELMER, JR., B.S., <i>Washington College, 1944</i>	Maryland
BEATTY, JOHN ORVILLE, <i>University of Nevada</i>	Nevada
BENSON, JOHN FISHER, <i>University of Maryland</i>	Maryland
BERGGREEN, RAYMOND GEORGE, A.B., <i>Carlton College, 1943</i>	Minnesota
¹ BERRY, RICHARD WAITMAN, A.B., <i>West Virginia University, 1943; West Virginia University School of Medicine, January 1944-June 1945</i>	West Virginia
BINDEMAN, WILLIAM WYLIE, B.S., <i>Wheaton College, 1944</i>	North Carolina
BLAIR, JAMES SEABORN, JR., <i>University of North Carolina; University of North Carolina School of Medicine, December 1943-June 1945</i>	North Carolina
BLEVINS, JOSEPH WENDELL, B.S., <i>Geneva College, 1943</i>	Pennsylvania

¹ Did not complete the year.² Entered second semester November 12, 1945.

- BUNCH, LITTLETON JAY, *University of North Carolina; University of North Carolina School of Medicine, December 1943-June 1945*..... North Carolina
- BUNN, DAVID GLENN, *University of North Carolina; University of North Carolina School of Medicine, December 1943-June 1945*..... North Carolina
- CAROUGE, GILBERT MORRIS, *University of Maryland*..... Maryland
- CHASE, HENRY VINCENT, *Ph.B., Loyola College, 1943*..... Maryland
- COFFEY, MICHAEL JOSEPH, *University of Notre Dame*..... New Jersey
- COHEN, BERNARD STANLEY, *University of Maryland*..... Maryland
- COHEN, IRVIN, A.B., *The Johns Hopkins University, 1944*..... Maryland
- COOPER, HARRY DOUGLAS, B.S., *Washington College, 1941*..... Maryland
- COOPER, WILLIAM BENJAMIN, JR., *University of Maryland*..... Maryland
- CORZINE, WILLIAM JENKINS, JR., *The Citadel*..... North Carolina
- COULTAS, ELIZABETH LOUISE, A.B., *Goucher College, 1944*..... New Jersey
- CUSHNER, IRVIN MORRIS, *University of Maryland*..... Maryland
- DENTRY, ELIZABETH ANNE GORDON, A.B., *Notre Dame College, 1943*..... Maryland
- DORMAN, PARKER STURGIS, A.B., *Amherst College, 1943*..... District of Columbia
- DUVALL, ROBERT CAYWOOD, JR., *University of Maryland*..... Maryland
- EPPE, WILLIFORD, *University of Maryland*..... Maryland
- EVANS, JOHN EBENEZER, JR., B.S., *Davidson College, 1943*..... North Carolina
- FARAINO, FRANK ANTHONY, B.S., *Loyola College, 1943*..... Maryland
- FINK, JOEL CHARLES, *University of Alabama; Medical College of Alabama, December 1943-May 1945*..... Alabama
- FISHER, DONALD ERNST, *University of Maryland*..... Maryland
- FITZGERALD, ROBERT GREESON, JR., *University of North Carolina; University of North Carolina School of Medicine, December 1943-June 1945*..... North Carolina
- FORER, GORDON RANDELEH, *University of Maryland*..... Maryland
- FRIEDMAN, ASHER AUTHUR, A.B., *The Johns Hopkins University, 1943*..... Virginia
- GAKENHEIMER, WILLIAM ALFRED, *The Johns Hopkins University*..... Maryland
- GARDNER, ROBERT KLINE, *University of Maryland*..... Maryland
- GEDDES, DAVID KOFOID, *University of California*..... California
- GERLACH, JANE KNOWLES, A.B., *Colorado College, 1943*..... Maryland
- GILLSON, EDWARD MICHAEL, A.B., *St. Peter's College, 1943*..... New Jersey
- GOLD, BENJAMIN MILLER, *University of North Carolina; University of North Carolina School of Medicine, December 1943-June 1945*..... North Carolina
- GRAU, EDWARD GORDON, B.S., *Loyola College, 1943*..... Maryland
- GROSSMAN, LOUIS WARD, *Westminster College*..... Pennsylvania
- HAASE, FREDERICK ROBERT, *University of Maryland*..... Maryland
- HAHN, ROBERT ROLAND, *University of Maryland*..... Maryland
- HALL, HOWARD ESSEX, *Western Maryland College*..... Maryland
- HEARNE, CALVIN BECK, *College of Wooster*..... Ohio
- HIGHTOWER, JOHN ALLEN, *Emory University, University of North Carolina School of Medicine, December 1943-June 1945*..... Florida
- HOGAN, JOHN FRANCIS, JR., *Loyola College*..... Maryland
- HOOKS, RICHARD EUGENE, *University of North Carolina; University of North Carolina School of Medicine, December 1943-June 1945*..... North Carolina
- HOUGHTON, JAMES FRANCIS, *Dartmouth College*..... New Jersey
- HUNTER, ROBERT CARL, *University of Maryland*..... Maryland
- IMBRIE, DAVID ELLWOOD, A.B., *Washington and Jefferson College*..... Pennsylvania
- JERNIGAN, LANE McDERMOTT, *University of Maryland*..... Maryland
- JUDD, ALLYN FRANCIS, A.B., *Tufts College, 1944*..... Massachusetts
- LEUNG, BERNARD, *University of Maryland*..... New York
- LEVIN, NORMAN, *University of Maryland*..... Maryland
- LIPRA, JOSEPH FRANCIS, *University of Maryland*..... Maryland
- MACHATA, FRANCIS KARL, Ph.B., *Loyola College, 1943*..... New York
- MANNINO, PETER PAUL, *Western Maryland College*..... Maryland
- MANSBERGER, ARLIE ROLAND, JR., *Western Maryland College*..... West Virginia
- MATTEN, CARL FREDERICK THEODORE, *The Johns Hopkins University*..... Maryland
- MITCHELL, WALLACE HERTTELL, B.S., *University of Florida, 1943*..... Florida
- MORROW, JOHN GORDON, JR., *Emory University*..... Georgia
- NACHLAS, NATHAN EDWARD, *University of Maryland*..... Maryland
- PERTZ, ELDEN HOBART, *West Virginia Wesleyan College*..... West Virginia
- PHILLIPS, DAVID LEE, A.B., *The Johns Hopkins University, 1943*..... Maryland
- PIGGOTT, JOHN BURR, JR., B.S., *Virginia Military Institute, 1943*..... District of Columbia

POST, WILLIAM REYMAN, <i>University of Mississippi</i>	Mississippi
POWELL, JACK HANSON, JR., A.B., <i>Emory University, 1943</i>	Georgia
RASCH, GEORGE CHESLEY, JR., <i>University of Maryland</i>	Maryland
RIBET, JAMES ERNEST, <i>University of North Carolina; University of North Carolina School of Medicine, December 1943-June 1945</i>	North Carolina
ROGERS, JOSEPH MEGEATH, <i>University of Maryland</i>	Virginia
ROSSER, JOHN HAYS, B.S., <i>Wheaton College, 1943</i>	Maryland
SACHS, SIDNEY HERMAN, <i>University of Maryland</i>	Maryland
SALVATI, EUGENE PHILIP, A.B., <i>West Virginia University, 1944; West Virginia University School of Medicine, January 1944-June 1945</i>	West Virginia
SCHAPIRO, JOSEPH SOLOMON, <i>The Johns Hopkins University</i>	Maryland
SCHNITZKER, WILLIAM FREDERIC, <i>Pennsylvania College</i>	Maryland
SCOTT, HARRY BATY, <i>University of Virginia</i>	Virginia
SENNING, FREDERICK STEPHEN, <i>University of Maryland</i>	Maryland
SHAW, JOHN HILL, B.S., <i>Hampden-Sydney College, 1943</i>	Virginia
SHEAR, JOSEPH, <i>University of Maryland</i>	Maryland
SHULMAN, MELVIN, <i>The Johns Hopkins University</i>	Maryland
SILBER, EARLE, <i>The Johns Hopkins University</i>	Maryland
SMITH, JOHN RICHARD, JR., B.S., <i>Washington College, 1943</i>	Maryland
SPINO, PASCAL DANIEL, <i>Bethany College</i>	Pennsylvania
STENSTROM, WILLIAM HAROLD, B.S., <i>College of Puget Sound, 1943</i>	Washington
SUSSMAN, HAROLD, A.B., <i>The Johns Hopkins University, 1943</i>	Maryland
SWINK, ROBERT LANDRUM, <i>Emory University</i>	Florida
TRENCH, JAMES MCKECHAN, <i>Bethany College</i>	Pennsylvania
VALDERAS, JOSÉ GERVASIO, <i>University of Puerto Rico</i>	Puerto Rico
VENABLE, SIDNEY JOHNSON, JR., B.S., <i>Hampden-Sydney College, 1943</i>	Maryland
WALTZ, ROBERT CLAUDE, B.S., <i>Washington & Jefferson College, 1943</i>	Ohio
WHITE, JOHN PHILLIPS, III, <i>The Johns Hopkins University</i>	Maryland
WILLIAMS, JAMES DELBERT, <i>Texas Technological College</i>	California
WILLIAMS, JOHNNY ELBERT, <i>Texas Technological College</i>	California
WINOKUR, GEORGE, <i>The Johns Hopkins University</i>	Maryland
¹ YOUNG, JOHN PAUL, <i>The Johns Hopkins University</i>	Maryland

SOPHOMORE CLASS, JULY 19, 1945 TO MARCH 22, 1946

ALECCE, ANGELO ANDREW, B.S., <i>Loyola College, 1945</i>	Maryland
ALLISON, GEORGE MALCOLM, <i>Marquette University</i>	Illinois
APONTE, JOSEPH LOUIS, <i>University of Puerto Rico</i>	Puerto Rico
AULD, DAVID, <i>Swarthmore College</i>	Maryland
BAKER, FRANK WILLIAM, JR., <i>University of Chicago</i>	Maryland
¹ BECKETT, ROBERT LEA, <i>University of Maryland</i>	Maryland
BEYER, DAVID HENRY, <i>Cornell University</i>	Minnesota
BISANAR, JAMES MILTON, <i>Davidson College</i>	North Carolina
BOND, DONALD BUCKEY, A.B., <i>Western Maryland College, 1938</i>	Maryland
BRONSTEIN, EUGENE LEONARD, <i>Emory University</i>	New York
² BROWN, JOHN RONALD, <i>University of New Hampshire</i>	Utah
BUCHNESS, JOHN MICHAEL, A.B., <i>Loyola College, 1944</i>	Maryland
BULLOCK, JOHN BOYD, <i>University of Richmond</i>	Virginia
BULLUCK, MATT HEYER, <i>Guilford College</i>	North Carolina
CHAIMOVITZ, ROBERT, <i>Bethany College</i>	Pennsylvania
CHELTON, ALICE KATHERINE GRAYBILL, <i>University of Chicago</i>	West Virginia
CONDON, JAMES FRANK, <i>Muhlenberg College</i>	Pennsylvania
CRECRAFT, HAROLD JAMES, A.B., <i>Taylor University, 1944</i>	Pennsylvania
DALTON, JAMES BRECKENRIDGE, JR., <i>University of Richmond</i>	Virginia
DEMPSEY, RAYMOND JOSEPH, B.S., <i>University of Notre Dame, 1944</i>	Illinois
¹ DODDS, ROBERT ARTHUR, <i>Franklin and Marshall College</i>	Pennsylvania
¹ DUNN, CHARLES GILBERT, Ph.B., <i>Loyola College, 1944</i>	Maryland
DWYER, FRANK PHILIP, JR., <i>Mt. St. Mary's College</i>	Pennsylvania
ENSOR, ROBERT ELLWOOD, <i>Western Maryland College</i>	Maryland
FRAVEL, CHARLES RICHARD, <i>Cornell University</i>	Virginia

¹ Did not complete the year.² Withdrew after satisfactory completion of year.

GOLOMBEK, LEONARD HARRY, <i>University of Maryland</i>	Maryland
GRANT, BOWIE LINN, <i>Potomac State School of West Virginia</i>	Maryland
GREEN, JAMES WILLIAM, <i>Western Maryland College</i>	Maryland
HAMRICK, GEORGE VINCENT, <i>Washington University</i>	Maryland
HANKINS, JOHN ROLAND, <i>University of Virginia</i>	Virginia
HELDRICH, FREDERICK JOSEPH, JR., <i>Yale University</i>	Maryland
HOBART, RICHARD LOREN, JR., <i>Washington and Lee University</i>	District of Columbia
HOLLOWAY, WILLIAM JACKSON, <i>Western Maryland College</i>	Maryland
INSLEY, MARION CLARENCE, JR., <i>University of Maryland</i>	Maryland
¹ KALAFAT, JOHN GEORGE, <i>Bethany College</i>	West Virginia
KASTNER, LEE NORMAN, <i>University of Pennsylvania</i>	Maryland
KAUFMAN, RAYMOND HENRY, <i>University of North Carolina</i>	New York
KEMP, KATHERINE VIRDIN, A.B., <i>College of Notre Dame, 1943</i>	Maryland
KENNEDY, CARL HUBERT, JR., <i>University of Virginia</i>	Pennsylvania
KOCH, LILLIAN DOROTHY, B.S., <i>University of Maryland, 1944</i>	Maryland
KUNST, FLORENCE ELIZABETH, A.B., <i>West Virginia University, 1944</i>	West Virginia
¹ LEARY, JOHN SYLVESTER, JR., <i>The Citadel</i>	South Carolina
LEOGRANDIS, STEPHEN C., <i>Duke University</i>	Massachusetts
LITHGOW, CHARLES HENRY, <i>Loyola College</i>	Maryland
MACK, HARRY PATTERSON, <i>Washington University</i>	New York
MALLIS, NICHOLAS, <i>Cornell University</i>	Maryland
MATTHEWS, BURTON VINCENT, A.B., <i>The Johns Hopkins University, 1943; Cornell University</i>	Maryland
MCCAULEY, BETTY JANE, B.S., <i>University of Maryland, 1943</i>	Maryland
MCCRUMB, FRED RODGERS, JR., <i>Loyola College</i>	Maryland
MOHLER, DONALD IGNATIUS, JR., <i>Loyola College</i>	Maryland
NEWELL, EDWARD ALPHONSO, <i>Western Maryland College</i>	Maryland
NISWANDER, GUY DONALD, <i>University of Michigan</i>	West Virginia
¹ O'DEA, DANIEL PATRICK, <i>Bucknell University</i>	Pennsylvania
PADUSSIS, STEPHEN KONSTANT, <i>University of Maryland</i>	Maryland
PETERSEN, PHYLLIS ANN, A.B., <i>University of Michigan, 1943</i>	Maryland
PLATT, JULIAN JAY, <i>Loyola College</i>	Maryland
POWELL, ALBERT MILTON, JR., <i>University of North Carolina</i>	Maryland
¹ RASKIN, HERBERT ALFRED, A.B., <i>University of Michigan, 1940; M.S.P.H., 1941; American University</i>	Michigan
RHYNE, JIMMIE LEE, <i>University of North Carolina</i>	North Carolina
RODRIGUEZ, EDELM ANTONIO, <i>College of the Holy Cross</i>	Puerto Rico
RUDOLPH, ROBERT LEE, <i>Ohio University</i>	Ohio
SCHERR, MERLE SUNDELL, <i>West Virginia University</i>	West Virginia
SCHWARTZ, BENSON CHARLES, <i>University of Maryland</i>	Maryland
SHELL, JOHN ROBERT, <i>University of Richmond</i>	Virginia
SILVERMAN, BENJAMIN K., <i>The Johns Hopkins University</i>	Maryland
SILVERSTEIN, DANIEL LEWIS, <i>Loyola College</i>	Maryland
SIWINSKI, THADDEUS CHARLES, A.B., <i>Loyola College, 1944</i>	Maryland
SMELSER, RENNERT MARQUETTE, <i>University of Maryland</i>	Maryland
SNYDER, WILLIAM ALLEN, <i>The Johns Hopkins University</i>	Maryland
STAHL, ROBERT RAY, <i>University of New Hampshire</i>	Pennsylvania
¹ STARKEY, NELL, <i>University of Maryland</i>	Georgia
¹ STARTZMAN, HENRY HOLLINGSWORTH, JR., <i>Loyola College</i>	Maryland
SWISHER, KYLE YOUNG, JR., <i>Bethany College</i>	West Virginia
TARR, NORMAN, <i>Washington College</i>	Maryland
THEUERKAUF, FRANK JOSEPH, JR., <i>Villa Maria College</i>	Pennsylvania
THOMAS, CLYDE DANA, JR., <i>Bethany College</i>	West Virginia
THUSS, WILLIAM GETZ, JR., <i>Emory University</i>	Alabama
WALTERS, HEZEKIAH G., JR., <i>University of North Carolina</i>	North Carolina
WARE, CHARLES INGERSOLL, <i>Wake Forest College</i>	New Jersey
WATERMAN, ROGER SHERMAN, <i>Bethany College</i>	Pennsylvania
WHITEHORN, CLARK ALLAN, <i>The Johns Hopkins University</i>	Michigan
WILSON, JOHN DEAN, <i>Bethany College</i>	Pennsylvania
WOMACK, WILLIAM SPENGLER, <i>Emory and Henry College</i>	Virginia

¹ Did not complete the year.² Withdrew after satisfactory completion of year.

FRESHMAN CLASS, SEPTEMBER 20, 1945 TO MAY 25, 1946

ABRAHAM, ROBERT AUMAN, B.S., <i>Franklin and Marshall College, 1945</i>	Pennsylvania
BACHMAN, LEONARD, B.S., <i>Franklin and Marshall College, 1946</i>	Maryland
BARLOW, LUNDIE WEATHERS, JR., <i>University of Minnesota</i>	Virginia
BARNARD, JOHN WILLIAM, B.S., <i>Milligan College, 1937</i>	Maryland
BELKIN, JOSEPH WILLIAM, <i>College of The Holy Cross</i>	Connecticut
BENJAMIN, WILLIAM PHILIP, A.B., <i>Brooklyn College, 1943</i>	New York
BLUNDELL, ALBERT EDWARD, <i>Temple University</i>	Utah
CLINE, JAMES ALEXANDER, III, <i>University of Pennsylvania</i>	Nebraska
COLLINGS, HAROLD, JR., <i>The Johns Hopkins University</i>	Indiana
DERINGER, FLORENCE HURTT, B.S., <i>Washington College, 1945</i>	Maryland
ENSOR, WILMER CLIFTON, JR., B.S., <i>Loyola College, 1945</i>	Maryland
EUBANKS, OTHA ALBERT, JR., <i>Duke University</i>	North Carolina
FORMAN, ROBERT BLAINE, <i>University of Oregon</i>	Oregon
GILL, JOSEPH EDWARD, <i>Union College</i>	Pennsylvania
GOLDSTEIN, ARTHUR JAY, <i>Bethany College</i>	New York
GORTEN, MARTIN KLAUS, A.B., <i>Western Maryland College, 1943</i>	New Jersey
GRAY, HARRY WILLIAMS, <i>Duke University</i>	Maryland
HARRIS, JAMES RADCLIFFE, <i>Temple University</i>	Pennsylvania
HENDERSON, CHARLES THOMAS, <i>The Johns Hopkins University</i>	Illinois
HUMPHREYS, CHARLES WESLEY, JR., <i>Duke University</i>	District of Columbia
KNABE, GEORGE WILLIAM, JR., <i>The Johns Hopkins University</i>	Michigan
KRIEGER, JOHN LOUIS, A.B., <i>St. Louis University, 1943</i>	Missouri
LEWIS, THOMAS EARL, <i>Pennsylvania State College</i>	Pennsylvania
LOCK, BURTON VERNON, <i>The Johns Hopkins University</i>	Maryland
LONDON, NATHANIEL JACOB, <i>The Johns Hopkins University</i>	Maryland
LONGLEY, GEORGE HENRY, <i>University of Minnesota</i>	Maryland
¹ LONGLEY, ROBERT WILLIAM, B.S., <i>Loyola College, 1945</i>	Maryland
¹ LUDLAM, RICHARD FAIRFAX, <i>University of Richmond</i>	Virginia
LUKENS, JAMES THOMAS, <i>Vanderbilt University</i>	Pennsylvania
MALCARNEY, ALBERTA ROSE, A.B., <i>University of Southern California, 1944</i>	California
MATTAX, HARRY MCCOY, <i>Western Maryland College</i>	Maryland
MAY, HOMER WOODROW, B.S., <i>University of Pittsburgh, 1944</i>	Pennsylvania
MCCORD, CHARLES FREDERIC, <i>Pennsylvania State College</i>	Indiana
MEDAIRY, MARY VERONICA, A.B., <i>College of Notre Dame of Maryland, 1943</i>	Maryland
METCALF, JOHN SHELBY, JR., <i>University of California</i>	California
MIDDLETON, EDMUND BISHOP, <i>The Johns Hopkins University</i>	Rhode Island
MILLER, MAX JAY, <i>University of Richmond</i>	Maryland
¹ MORGAN, JOHN ACREE, <i>Emory University</i>	Georgia
MOYER, JOHN LEWIS, III, <i>University of Minnesota</i>	Pennsylvania
NEAL, HUNTER SHAINLINE, <i>Vanderbilt University</i>	Pennsylvania
NEUMAYER, FRANCIS, <i>University of Maryland</i>	Pennsylvania
NEWELL, JOSEPHINE EVELYN, <i>University of the State of South Carolina</i>	North Carolina
NICKLAS, GILBERT LEE, B.S., <i>Franklin and Marshall College, 1946</i>	Maryland
PANZARELLA, JOHN HENRY, <i>Forham University</i>	New York
PAERLHOFF, MERRILL ELLIOTT, <i>University of Maryland</i>	Maryland
¹ PHILLIPS, ROBERT FRANCIS, A.B., <i>University of Michigan, 1942</i>	Michigan
¹ PORTER, HARRY, <i>Temple University</i>	Pennsylvania
RASKIN, HOWARD FRANK, <i>The Johns Hopkins University</i>	Maryland
RIDDEL, CLIFFORD THURSTON, JR., A.B., <i>Bridgewater College, 1933</i>	Virginia
ROHRIG, CHARLES BURNS, <i>Vanderbilt University</i>	Massachusetts
¹ ROGERS, RALPH PEEL, JR., <i>Duke University</i>	North Carolina
SAREWITZ, ALBERT BERNARD, <i>University of Pennsylvania</i>	New Jersey
¹ SCHALK, WALTER ELMER, <i>University of Chicago</i>	Illinois
SCHER, JORDAN, MAYER, A.B., <i>Wesleyan University, 1946</i>	Maryland
SCHMALE, ARTHUR HENRY, JR., <i>Pennsylvania State College</i>	Nebraska
SCHNAPE, NATHAN, B.S., <i>Washington College, 1940</i>	Maryland
SCHORR, RASHI, B.S., <i>University of Miami, Florida, 1944</i>	Florida
SCHREIBER, RICHARD DAVID, <i>Bethany College</i>	Illinois
SHERARD, MARGARET LEE, A.B., <i>Seton Hill College, 1945</i>	West Virginia
¹ SMITH, CHARLES ELLIOTT, <i>University of Maryland</i>	Georgia
SMITH, MEREDITH PARKS, <i>St. Lawrence University</i>	Minnesota

¹ Did not complete the year.

SNIDER, KENNETH BRUCE, <i>University of Maryland</i>	Texas
² SOSNOWSKI, ANDREW RAYMOND, JR., <i>B.S., Loyola College, 1945</i>	Maryland
¹ SOWERS, EDWARD FRANCIS, <i>A.B., West Virginia University, 1941</i>	West Virginia
¹ SPANGENBERG, HARRY ALAN, JR., <i>University of Scranton</i>	Pennsylvania
SPITTELL, JOHN ALLEN, JR., <i>B.S., Franklin and Marshall College, 1944</i>	Maryland
STAHLER, EARLIN JOHN, <i>University of Maryland</i>	Pennsylvania
STANFIELD, ELWIN EUGENE, <i>University of Pennsylvania</i>	California
STECKLER, ROBERT JOSEPH, <i>A.B., Evansville College, 1943</i>	Indiana
² STEIN, ELIZABETH JANE, <i>A.B., University of Delaware, 1944</i>	Delaware
STEVENSON, EDWARD WARD, <i>Duke University</i>	Virginia
STRAHAN, JOHN FRANKLIN, <i>Duke University</i>	Maryland
TILLEY, RUSSELL MCFARLANE, JR., <i>University of Rochester</i>	New York
TIMANUS, JAMES KYNER, <i>Oberlin College</i>	Ohio
TRAMER, ARNOLD, <i>University of Maryland</i>	Maryland
TRETTIN, GENE DOUGLAS, <i>Ursinus College, 1946</i>	Maryland
WARNOCK, ROBERT GEORGE, <i>Bates College</i>	Ohio
WATSON, FRANK YANDLE, <i>Duke University</i>	North Carolina
WELCH, ELBERT SYLVESTER, <i>Duke University</i>	Alabama
² WHEELFR, ROBERT LELAND, <i>A.B., Stanford University, 1944</i>	California
¹ WILLIAMS, WILLIAM AUGUSTUS, JR., <i>Mercer University</i>	Georgia
WOLFE, CAROLYN DEWITT, <i>A.B., Hollins College, 1945</i>	New Jersey

¹ Did not complete the year.

² Withdrew after completing the year.

³ Withdrew in good standing; did not complete the year.

STUDENTS IN ART AS APPLIED TO MEDICINE

FELIX BENEDICT WEINBERG *Maryland*

SUMMARY OF STUDENTS

July 19, 1945 to May 25, 1946

<i>Medical Students</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>
Senior Class.....	95	3	98
Junior Class.....	92	4	96
Sophomore Class.....	76	7	83
Freshman Class.....	74	8	82
	—	—	—
	337	22	359
Withdrawals.....	25	2	27
	—	—	—
	312	20	332
Student of Art.....	1	0	1
	—	—	—
	313	20	333

GEOGRAPHICAL DISTRIBUTION OF STUDENTS

July 19, 1945 to May 25, 1946

Alabama.....	2	Michigan.....	11
Arizona.....	1	Minnesota.....	2
California.....	8	Mississippi.....	1
Connecticut.....	3	Missouri.....	1
Delaware.....	4	Nebraska.....	2
District of Columbia.....	5	Nevada.....	1
Florida.....	7	New Jersey.....	8
Georgia.....	10	New York.....	6
Illinois.....	5	North Carolina.....	13
Indiana.....	3	North Dakota.....	1
Kentucky.....	2	Ohio.....	5
Maryland.....	175	Oregon.....	1
Massachusetts.....	4		

Pennsylvania.....	21	Virginia.....	12
Rhode Island.....	1	Washington.....	1
South Carolina.....	1	West Virginia.....	18
Tennessee.....	1		
Texas.....	1	FOREIGN	
Utah.....	4	Puerto Rico.....	5

LIST OF COLLEGE SOURCES OF STUDENTS ENROLLED

July 19, 1945 to May 25, 1946

Alabama, University of.....	2	Norwich University.....	1
American University.....	1	Notre Dame of Maryland, College of..	1
Amherst College.....	1	Notre Dame, University of.....	3
Arizona, University of.....	1	Oberlin College.....	2
Bates College.....	1	Ohio University.....	1
Bethany College.....	11	Oregon, University of.....	1
Bridgewater College.....	2	Pennsylvania State College.....	3
Brooklyn College.....	1	Pennsylvania, University of.....	4
Brown University.....	2	Pittsburgh, University of.....	1
Bucknell University.....	1	Potomac State School, W. Va.....	1
California, University of.....	4	Puerto Rico, University of.....	1
Carleton College.....	1	Puget Sound, College of.....	1
Chattanooga, University of.....	1	Richmond, University of.....	5
Chicago, University of.....	12	Rochester, University of.....	1
Citadel, The.....	2	St. Lawrence University.....	1
Colorado College.....	3	St. Louis University.....	1
Columbia University.....	2	St. Peter's College.....	1
Cornell University.....	4	Scranton, University of.....	1
Dartmouth College.....	2	Seton Hall College.....	1
Davidson College.....	2	Sieton Hill College.....	1
Delaware, University of.....	1	Soux Falls College.....	1
Dickinson College.....	1	Southern California, University of....	1
Duke University.....	12	South Carolina, University of State of	2
Emory University.....	15	Stanford University.....	1
Emory and Henry College.....	1	Swarthmore College.....	1
Evansville College.....	1	Taylor University.....	1
Florida, University of.....	1	Temple University.....	3
Fordham University.....	1	Texas Technological College.....	2
Franklin & Marshall College.....	9	Transylvania College.....	1
Geneva College.....	1	Trinity College.....	2
Georgia, University of.....	1	Tufts College.....	1
Gettysburg College.....	5	Union College.....	1
Goucher College.....	1	Ursinus College.....	1
Guilford College.....	1	Utah, University of.....	2
Hampden-Sydney College.....	3	Utah State Agricultural College.....	1
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PENICILLIN IN TETANUS WITH AN ANALYSIS OF THE SPINAL FLUID IN TETANUS*†

ALVIN H. HONIGMAN, B.S., M.D., AND WILLIAM C. EBELING III, B.S., M.D.

The increasing interest in the newer antibiotic agents has led to their clinical use against bacterial diseases where the mortality rate has remained high despite antisera and sulfonamide therapy. One such disease is tetanus, where established methods of treatment with antisera and vigorous local surgical procedures often result in unsatisfactory recovery rates.

Vinnard (1), in reporting cases of tetanus treated in a ten year period at the Charity Hospital of Louisiana, found a total mortality rate of 45 per cent. In the last three years at this institution, the mortality rate has been reduced to 31 per cent. Vener and Bower (2) in 1941 reported 100 cases of tetanus from the Los Angeles County Hospital with a mortality rate of 29 per cent. Moore and Singleton (3) in 1939 reported 102 cases at John Sealy Hospital with a mortality rate of 50 per cent. The general mortality rate in a great number of cases reported has ranged from 30 per cent to 50 per cent. At the University of Maryland Hospital from 1920 to 1946, there have been 78 cases of tetanus treated with a mortality rate of 46.5 per cent. It can be seen from these figures that improved treatments of tetanus are needed. In view of this clinicians have turned to penicillin.

Reported use of penicillin in the treatment of tetanus is beginning to appear in the literature. Neter (4) studied the action of penicillin on the tetanus toxin and observed that sodium penicillin in amounts of 500 to 5000 Oxford units caused only a minimal neutralizing effect if any on the tetanus toxin. Herrell, Nichols, and Heilman (5) have shown penicillin to be active

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against *Cl. tetani* in vitro. Vinnard (1) administered penicillin in varying total amounts from 250,000 to 600,000 Oxford units to five patients at Charity Hospital and reported a mortality rate of 40 per cent without observing any beneficial effects of the drug on the course of the disease other than its prophylactic action against secondary infections and pneumonia. Buxton and Kurman (6) have described two cases of tetanus in which recovery occurred after the use of combined penicillin and antisera therapy. Weinstein and Wesselhoeft (7) have also reported two cases of severe tetanus treated successfully with large doses of penicillin in addition to antisera. These authors demonstrated the antibiotic influence of penicillin on the *Cl. Tetani in vivo* by observing the disappearance of the organism from the wounds twenty-four hours after the first dose of penicillin. Altemeier (8) at the University of Cincinnati reviewed sixteen cases of tetanus in which the mortality rate was 62.5 per cent. All of the patients received anti-tetanus serum and thirteen were given penicillin in addition; the three patients not given penicillin were used as controls. In contrasting the cases in which the drug was used with the control group, Altemeier attributed to penicillin no obvious beneficial effects except in one case where a complicating pneumonia responded to penicillin therapy. Altemeier concluded that his studies failed to demonstrate any therapeutic effect of penicillin on the course of established clinical tetanus, but that penicillin is of definite value in controlling complicating pneumonia or secondary wound infection.

In the following three cases of tetanus here reported, penicillin was administered to determine its effect on the course of the disease.

CASE REPORTS

Case 1. M. J., a 25 year old colored male shipyard worker was admitted to the University Hospital on September 9, 1945, complaining of stiffness of his jaw and back, severe backache, and attacks of muscle spasm in his chest of three days duration. There was a moderately rapid progression of muscle stiffness to his back, chest, and abdominal muscles. Painful episodes of muscle spasm occurred with extension of his back and legs. There was no history of animal bites, scratches, operations, or drug poisoning.

The physical examination on admission revealed a well-developed and well-nourished colored male, who was apprehensive and perspiring profusely. The temperature taken rectally was 100 F; the pulse rate was 94, and the respirations were 24. The blood pressure was 150 systolic over 70 diastolic. The patient could not talk well because of inability to open the mouth more than 1.5 cm. His motions were slow, spastic, and painful. The masseter and neck muscles were spastic. Dysphagia and pytalorrhea were present. The abdominal muscles were tense and spasm of the erector spini muscles held the vertebral column rigidly extended. The left foot presented a pustule measuring 0.5 cm. by 1.0 cm. on the medial aspect; and a non-inflammatory hyperkeratotic lesion 1.2 cm. in diameter on the plantar surface. The deep reflexes were symmetrically active and the pathologic reflexes were absent. The rest of the physical examination was negative.

Laboratory examinations on admission revealed no albumin, sugar, acetone, or abnormal cellular elements in the urine. The specific gravity was 1.014. The hemoglobin was 14.5 grams and the red blood cell count was 5.64 millions. The leucocyte count was 5900 cells per cu. mm. The differential count was normal. Two serologic tests for syphilis were re-

ported to be positive and the spinal fluid Eagle complement-fixation test was also reported to be positive.

On admission to the ward, the patient was given 0.3 gram of sodium amytal intravenously. The resultant relaxation permitted a lumbar puncture. After 10 cc. of spinal fluid were withdrawn, 30,000 units of penicillin were injected intrathecally. The spinal fluid was clear and under a pressure of 280 mm. of water. The dynamics were normal. The fluid contained two white blood cells per cu. mm. The Pandy test was negative. The total protein concentration was 16 mgm. per cent; the spinal fluid sugar, 39 mg. per cent.

Forty thousand units of penicillin were injected intramuscularly every three hours. Chloral hydrate induced moderate sedation. Because of increased muscle spasm on the day following admission, the patient received 60,000 units of tetanus antitoxin in 300 cc. of 0.9 per cent saline intravenously. Wide incision of the pustule on the patient's foot was undertaken and followed by insertion of a gauze drain saturated with tetanus antitoxin. Sixty thousand units of antitoxin in saline intravenously were repeated in five hours and 60,000 units were injected intramuscularly. Five thousand units were then given intramuscularly every day for the next five days. Codeine sulfate and sodium phenobarbital proved ineffective in relieving the patient's hyperkinesis and tribromethanol was given per rectum to quiet the spastic movements. By the fifth hospital day, muscle spasm had decreased and smaller doses of sedatives were used. Penicillin was discontinued after the fourteenth day of hospitalization. The patient was allowed out of bed on September 23, 1945, seventeen days after admission.

In this case penicillin alone failed to alter the progression of muscle spasticity and it was not until antitoxin and heavy sedation were given that improvement was noted. A blood culture drawn on admission was sterile and culture from the incised pustule revealed no organisms identifiable as tetanus bacilli. This patient received a total of 225,000 units of tetanus antitoxin and 4,510,000 units of penicillin.

Case 2. S. C., a 36 year old colored male was admitted to the medical service on October 11, 1945 because of difficulty in opening his mouth and stiffness of the back. The patient dated the onset of the present illness from four days before admission when he noticed his jaws became tired from talking or chewing. In the following two days, the back muscles became more stiff and he was unable to walk. About one week prior to the onset of these symptoms, the patient had noticed a tender area on his right shoulder. On further questioning it was revealed that he had been receiving morphine sulfate, 8 milligrams and atropine sulfate, 1.2 milligrams daily by hypodermic injections, for about six months. The needles had been cleaned with alcohol before injections. The marital history disclosed the interesting facts that the patient's second wife had died from "lock-jaw" and that she also had been a drug addict.

On admission the temperature was 99.6 F., the pulse rate 120 per minute, respiratory rate 18 per minute, and the blood pressure was 130 systolic over 90 diastolic. The physical examination revealed a well-developed colored male, moderately apprehensive, displaying persistent muscle spasm. He lay in bed with his back arched slightly. There was a moderate spasm of the masseter muscles and the jaws could barely be opened. The neck was resistant to flexion. On the right shoulder there was a soft, hot, fluctuant mass, 4 cm. by 5 cm. in diameter. A smaller mass was present on the left shoulder. The deep reflexes were equally hyperactive. There were no pathologic reflexes elicited. The chest expanded poorly and the respirations were shallow.

A urine examination on admission revealed many red blood cells per high power field and a three plus albumin. The hemoglobin was 89 per cent, 13.0 grams; the red blood cell count, 4.75 millions; the leucocyte count, 8,100 cells per cu. mm. The differential count was normal. The blood calcium and phosphorus concentrations were within normal limits.

The diagnosis of tetanus was made. A lumbar puncture was performed under sodium pentothal anesthesia. The spinal fluid pressure was 140 mm. water. The fluid was clear and contained two lymphocytes per cu. mm. The Pandey test was negative. After the fluid was removed, 30,000 Oxford units of penicillin were injected intrathecally. The two abscesses were incised and the purulent material obtained was cultured anaerobically. *Clostridia tetani* were isolated from both abscesses. Forty thousand Oxford units of penicillin were given intramuscularly every three hours. Sixty thousand units of tetanus antitoxin were given intravenously in 0.9 per cent saline; 60,000 units intramuscularly; and 20,000 units were injected about each abscess. Another 60,000 units of antitoxin were given intravenously six hours later, making a total of 220,000 units given in the first twenty-four hours. Sedation was accomplished by means of sodium phenobarbital and paraldehyde. The patient received 45,000 units of tetanus antitoxin intramuscularly on the second hospital day and 40,000 units intramuscularly daily for the next six days. The muscle spasm persisted so paraldehyde and tribromethanol were used freely to achieve relaxation. Concentrated warm saline enemata were given for abdominal distension. The temperature spiked to 103.4 F. on the fourth day; the patient at this time presented a marked lag of the right chest. Many rales were heard over the right base. The pulse and respiratory rates were increased. Oxygen therapy and sodium sulfadiazine given by parenteral route were begun. The patient developed a sino-auricular tachycardia and auricular and ventricular premature beats. There were no signs of cardiac failure. Later that day, tenderness and edema of the left leg were noticed. The leg was elevated. Dicumarol and papaverine were administered. Another lumbar puncture was done and 30,000 Oxford units of penicillin were injected intrathecally. A roentgen x-ray examination of the chest on the eighth day revealed consolidation in the right base. A bullet, which had been present for three years, was incidentally seen in the right lung. From the ninth to the twenty-second day, the temperature varied between 102 F. and 103 F. The dose of antitoxin was reduced to 20,000 units intramuscularly on the twelfth day and thereafter 5,000 units were given daily for the next fourteen days. The pneumonia improved slowly. The thrombophlebitis of the left leg improved under anti-coagulants and paravertebral block with procaine. During the entire hospital period the patient was incontinent of bowel and bladder. This resulted in a severe sacral decubitus ulceration which was extremely resistant to therapy. Parenteral fluids, vitamins, and blood were given as supportive measures. By the twenty-eighth hospital day, all muscle spasm had disappeared. The temperature, however, remained elevated; the patient suffered periods of disorientation and continued to have a cough productive of purulent blood-streaked sputum. The signs of infection persisted for which he continually received chemotherapy and on the forty-first hospital day, while on the bedpan the patient gasped, became cyanotic and died.

The post-mortem examination disclosed the presence of an unresolved lobar pneumonia of the right lower lobe with a lung abscess of the right upper lobe. There was also found a hemorrhagic infarction of the left lower lobe.

Penicillin appeared to have had no effect on the subsequent course or on the complicating infections. The initial two spinal fluid cultures were reported as containing organisms which morphologically and culturally resembled *Clostridia tetani*. The subsequent spinal fluid cultures were sterile.

Case 3. R. S., a 38 year old colored female, was admitted to the University Hospital on April 2, 1946 because of stiffness of the neck and back and inability to open her mouth. The symptoms had persisted for about five days. The jaws had become progressively fixed so that she could eat only liquid foods. There had been some pain and soreness along the left jaw. The patient had arthritis for three years and had a left antrotomy in January to remove a possible focus of infection. An ingrown toe-nail was treated in another hospital

in February and healed readily. There have been no other injuries, scratches or any animal bites. The family and past histories were irrelevant.

On admission, the temperature was 98.6 F., the pulse rate was 84, the respiratory rate was 22, and the blood pressure 128 systolic over 74 diastolic. The physical examination revealed an obese colored female lying quietly in bed in no acute distress. The neck was held rigidly. The pupils were round, regular, and equal. They reacted to light and accommodation. The teeth were clenched tightly and could be separated only about 1.5 cm. The temporo-mandibular joint was not tender. The pharynx was not visualized. The Chvostek's sign was negative. An examination of the heart and lungs revealed no evidence of disease. The abdominal and back muscles were spastic, and there was an increase in the tone of the extremities. The deep reflexes were hyperactive and equal. No pathologic reflexes were elicited. There were crusts about the nails of the large toe of both feet.

The laboratory reported a urine within normal limits. The hemoglobin was 92 per cent, 12.8 grams, and the red blood cell count was 3.96 millions. The leucocyte count was 5,500 cells per cu. mm. The differential count was normal. The corrected sedimentation rate was 27 mm. in one hour. The volume of packed red blood cells was 42 mm. Blood chemical determinations were within normal ranges. The serologic test for syphilis was negative.

On admission, the patient was given intravenous fluids. A lumbar puncture was done under sodium pentothal anesthesia. The puncture revealed clear, colorless spinal fluid under an initial pressure of 130 mm. water. The Pandy test was negative. One lymphocyte per cu. mm. was found. The spinal fluid chemical findings were within normal limits. Because of the absence of any foci of infection and the uncertainty of the diagnosis on admission, specific therapy was withheld until the second hospital day. At that time the patient developed definite opisthotonos and was given 60,000 units of tetanus antitoxin intravenously in 0.9 per cent saline and 60,000 units intramuscularly. A second intravenous dose of 60,000 units was given six hours later. The patient received 40,000 units of antitoxin intramuscularly on the third day and 5,000 units intramuscularly each day afterwards for five days. Penicillin was administered intramuscularly in dosage of 30,000 Oxford units every three hours. Mild sedation was accomplished with sodium phenobarbital. Interostrim used later, effected much greater relaxation. On the fourth day, the patient was improved and during the next week the muscle spasms lessened. Penicillin was continued until the twenty-second day.

Cultures from the left and right large toes and left nostril revealed a mixture of staphylococci and streptococci. No organisms resembling *Clostridia tetani* were found. The blood and spinal fluid cultures were sterile. A roentgenologic examination of the chest and spine were negative, however, a similar examination of the sinuses was reported as left ethmoid and left antrum sinusitis.

The patient was discharged as cured on the twenty-fifth hospital day. A total of 245,000 units of tetanus antitoxin and 5,040,000 units of penicillin was given during the hospitalization.

This patient made a complete recovery. The absence of complications may be attributed to penicillin, but no change in the character of the muscle hypertonicity occurred under drug therapy.

COMMENT

The reported positive spinal fluid culture in Case 2 was viewed with considerable interest since every precaution had been taken not to contaminate the spinal fluid especially in view of the proximity of the deltoid abscesses. Great care had been employed in cleaning up the back with iodine and alcohol before introducing the spinal puncture needle.

The spinal fluid was inoculated on blood agar, chocolate agar, brain broth and Brewer's medium. The organism grew in Brewer's thioglycolate anaerobic medium after 72 hours incubation developing a slightly putrid odor. The bacteriologist described the organism as a long slender gram-positive bacillus, slightly motile and forming large terminal drumstick spores. Transfer was made to milk, gelatin, blood agar plates, and various sugars. No coagulation was observed in the milk but a small amount of gas was formed. Slight liquefaction took place in the gelatin. No gaseous fermentation occurred in dextrose, lactose, sucrose, maltose, or mannite. Culturally and morphologically the isolated rod resembled *Cl. tetani* but considerable doubt was cast on the identification when a ten day anaerobic broth culture filtrate injected into mice failed to produce any toxic symptoms. No conclusions were drawn as to whether the organism was an attenuated form of *Cl. tetani* or just a contaminant.

The report of the Gram-positive anaerobic rod cultured from the spinal fluid stimulated a diligent search of the literature for similar cases and just one other reported case was found. Lacy and Murdock (9) in 1921 described a case of tetanus from the Alleghany Hospital in which tetanus bacilli were cultured from the spinal fluid. In this case anaerobic culture plates showed pure cultures of tetanus bacilli. To check the identity of the isolated organisms, these authors inoculated guinea pigs with saline suspensions of the organisms from the original agar cultures, and observed typical tetanic convulsions in several of these animals: Lacy and Murdock proposed the possibility that tetanus spores were phagocytosed and transported to the spinal canal where they were deposited and remained dormant until conditions developed favorable for their growth and reproduction. These authors cited as substantiation of their theory, the work of Vaillard, Tarozzi, and Cantora who demonstrated that when animals were inoculated subcutaneously with detoxicated tetanus spores, the spores were phagocytosed and carried to parts of the body where they remained dormant until the tissues became devitalized, as a result of injury, and then the decrease in oxygen created a field favorable for the development of the tetanus bacillus.

In reviewing the literature on tetanus it is surprising how few reports contained any mention of spinal fluid cultures. Even in large series of cases, no statement was made of attempting spinal punctures. The technical difficulties are probably responsible for the paucity of spinal fluid examinations. The marked stiffness of the erector spini muscles and the inability to obtain relaxation makes introduction of the spinal needle exceedingly difficult. In the three cases here reported, intravenous anesthesia was necessary to obtain the necessary flexibility to carry out the procedure.

Of the 78 cases of tetanus at the University Hospital from 1920 to 1946, spinal fluids were examined in 23 of the cases. Of these cases, spinal fluid cultures were obtained in 12 of which only 3 were mentioned as being on anaerobic media. One culture on aerobic media revealed a gram-positive rod which was questioned as being a contaminant. Table I presents the spinal fluid findings in 23 cases of tetanus.

In analyzing these cases, the spinal fluid was usually clear. The cerebrospinal fluid pressure was normal or elevated, the highest in this series being 280 mm. water pressure. The spinal fluid cell count was usually within normal limits. The Pandy test for globulin was negative to a trace in most cases. The spinal fluid chemical constituents were within normal ranges. Cultures were negative.

SUMMARY AND CONCLUSIONS

The results of the three cases here reported substantiate the findings of other clinics that penicillin does not appreciably alter the course of tetanus. Though the dosage of penicillin used was higher than in other reported series there was no definite effect on the duration or severity of the spasmodic contractions. In two of the cases the administration of penicillin perhaps prevented any complications. In case 2, on the other hand, the patient while on penicillin developed pneumonia and later a lung abscess. This patient was free of symptoms of tetanus at the time of death.

Death in tetanus results from the fixation of lethal amounts of toxin in the tissues of the central nervous system. Firor (10, 11) has shown that the toxin is produced in susceptible tissues by the tetanus bacillus and is then carried from the focus of infection by the lymphatics and blood to the central nervous system. Once fixation has occurred there, it would seem unlikely that any type of therapy whether antisera or antibiotic would effect the fatal outcome of the disease. Although penicillin has been shown to be effective bacteriostatically against the tetanus bacillus, both *in viro* and *in vitro*, the antibiotic has no neutralizing effect on the toxin. In this respect the use of penicillin in tetanus is similar to its action in gas gangrene. It was noted that in cases of gas gangrene developing in war wounds, penicillin would control the local infection only if wide debridement and drainage were instituted, but the drug had little effect on the profound toxemia. The specific action of penicillin in tetanus would therefore seem limited to aiding the elimination of the bacilli in the local area of infection and preventing further production of toxin. The further role of penicillin in the treatment of tetanus is in the controlling of secondary wound infection and complicating pneumonias. Large doses of antitoxin, proper local surgical procedures, adequate sedation, and careful supportive treatment are still essential therapeutic measures in tetanus.

TABLE I
Analyses of Spinal Fluid in Tetanus

CASES	DESCRIPTION OF SPINAL FLUID	PANDY TEST	SPINAL FLUID PRESSURE IN MM. WATER	LEUCOCYTE COUNT	DIFFERENTIAL COUNT	SUGAR MGW. <i>per cent</i>	TOTAL PROTEIN MGW. <i>per cent</i>	SPINAL FLUID WASSERMANN	CULTURE
1	clear	0	normal	0				0	smear negative
2	clear	0	increased	0				0	negative (not grown anaerobically)
3	clear	0		2					negative (not grown anaerobically)
4				"many"					
5			normal	4				0	
6	clear		normal	3					smear negative
7	clear	0	normal	9				0	negative (not grown anaerobically)
8	clear	0		1				0	smear negative
9				26					negative (not grown anaerobically)
10		trace	200						smear, aerobic and anaerobic cult. neg.
11	clear	trace	200	0					negative (not grown anaerobically)
12		1+		20					
13		0	200	3			33		
14	Xanthochromic	0	normal	10		67			
15		0		1					
16	clear	0	160	6					
17	Xanthochromic	trace	80	6	100% lymph		55	0	negative (not grown anaerobically)

18	Xanthochromic	4+		3	2 lymphs 1 PMN	90	74	0	negative (not grown anaerobically) aerobic cult.-Gram neg. rod, no anaerobic culture smear negative. Aerobic cult. Staph. aur. No anaerobic culture
19	bloody	trace		10					
20	clear	trace	250	0					
21	clear	0	280	2	100% PMN	39	16	Positive	negative (not grown anaerobically)
22	clear	0	140	2	100% lymph.		39	0	<i>Cl. Tetani</i> , Anaerobic and Aerobic cultures
23	clear	0	130	1	100% lymph.	58	21	0	negative aerobically and anaerobically

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17 KETOSTEROIDS*†

A REVIEW OF THE LITERATURE

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The discovery that material with the activity of gonadal hormones can be extracted from human urine led to the attractive and plausible hypothesis that the level of this urinary excretion might give an indication to the secretory activities of the gonads. The use of biologic assays of androgenic and oestrogenic steroids in urine as a laboratory aid to diagnosis has been investigated by many. It has been pointed out by one group of investigators, Callow, Callow, and Emmens (1) that these biologic assays were specific neither for any one substance nor for a single gland. There is a chemical test for steroids, however, which has a very great advantage over the biologic method with respect to sensitivity, ease of operation and percentage of error. This is a color reaction introduced by Zimmerman as a test for "androgens" which has been further developed by investigators of endocrinology for application to urinary extracts.

The color reaction is based on the fact that substances containing an active methylene group ($\text{CH}_2\cdot\text{CO}$) in the presence of alkali and metadinitrobenzene produce a red color, which may be used for quantitative assay. Among the ketosteroids (KS), the color produced depends upon the position of the ketone group. Steroids with a ketone group on the 17th carbon atom (17 KS) develop an intense broad absorption band with a maximum in the green, whereas this is not true of other ketosteroids (3', 6', and 20' KS). Callow, Callow, and Emmens designated the substance measured by this test as 17 ketosteroids.

Estrone, which is a 17 KS, is not included in the assay, since it is removed by washing with alkali, a step in the extraction procedure.

Ketosteroids and androgens are often confused. Not all 17 KS are androgens, nor are all the androgens 17 KS. Among normal men the 17 KS have a dual source, namely the testicle and the adrenal cortices. Among women, most, if not all, of these steroids are derived from the adrenal cortex. Therefore, it should be emphasized that the colorimetric assay for urinary 17 ketosteroids is not a test for androgens as such, although it may parallel the biologic test for the latter in many cases (1).

It seems, then, that the test is an index, not a measure, of the combined activity of the adrenal cortex and testes in the male, and the adrenal cortex alone in the female. Theoretically, the 17 KS assay might be expected to

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give indirect information concerning the secretory activities of the anterior pituitary and thyroid glands, since both these glands influence the activities of the testes and adrenal cortex.

DAILY VARIATION IN 17 KS EXCRETION

Before the urinary 17 KS excretion can be used as an index of either normal or abnormal endocrine function, normal standards of excretion must be established. It has been found that the amount of 17 KS excretion in the urine of normal men, women, and children varies from day to day (5). The cause of this daily fluctuation by healthy persons is as yet unexplained. Boys and girls excrete essentially no 17 KS from the time they are born until they are 7 or 8 years old. The mean excretion of total neutral KS of children under 7 years is about 1.3 mg. in 24 hours (2). From then, until they are approximately 18 years of age, the 17 KS excretion increases to adult levels. "Children should be excreting at least 1 mg. a day after they have passed their 12th birthday. The rise of 17 KS in urine during adolescence correlates with the increase in size of genital structures. Since the adrenal cortex and testes are believed to be the normal sources of urinary 17 KS, the finding that boys did not secrete significantly greater amounts than girls suggests that the adrenal cortex is the chief site of origin of the 17 KS during childhood.

"Adult women have values which correspond closely to those obtained for children 17-18 years old" (6). Men, however, have a higher mean 17 KS than do women. At just what age this sex difference becomes evident is not known. The mean excretion of 17 KS for adult women is about 7 to 10.2 mg. and for adult men about 15 mg. (2).

Average daily Alpha-neutral KS parallel the total output. The average daily Beta-neutral KS excretion comprises 8 to 15 per cent of the average total output. The Beta-neutral KS excretion of adult men has been found to be essentially the same as that of women: 1.2 mg. in 24 hours by adult men and 1.1 mg. in 24 hours by women. This fact was offered by Talbot, Butler and MacLachlan (2) as evidence that whereas Alpha-neutral KS probably arise from the adrenal cortex and gonadal excretions, the Beta-neutral KS are an excretory product only of the adrenal cortices.

Less complete study of 17 KS excretion in normal elderly persons suggest that values fall off in later decades. Mean values range from 2.2 to 4.8 mg. in 24 hours in men between 70 and 75 years of age (4).

Superficial observations have found no striking correlation between the 17 KS output and race, complexion, weight and surface area. There is no evidence of any cycle in the excretion (5).

Tentative appraisal of the urinary 17 KS excretion in various conditions in terms of normal, decreased, or increased excretion can only follow the es-

establishment of preliminary normal standards of reference for individuals of varying ages. In reviewing normal figures, it can be seen that, while it is possible to detect a hypoexcretion of 17 KS by adults and older children, it is impossible to detect abnormally low values for children under 8 or 9 years of age. Abnormally high values can be recognized easily in individuals of any age.

MALNUTRITION

Malnutrition as a result of any cause is likely to be associated with low assays. It seems that "those with impaired intestinal absorption have the lowest values". In a series of 11 cases reported by Fraser, Farber, Albright, Sulkowitch, and Reifenshtein (4), a few cases of anorexia nervosa were quite normal in spite of the debility. Two cases of malnutrition and anorexia nervosa were interesting in that "the 17 KS output rose from 1.7 and 2.9 mg. to 4.5 and 5.8 mg. and from 1.8 and 1.8 to 6.6 and 4.6 mg. in 24 hours respectively" with treatment. Only in one case was the assay below 0.5 mg. for 24 hours, and that was a case of chronic terminal ileitis, steatorrhea, and deficiency of many fat soluble vitamins. "The fact that the 17 KS excretion fails to disappear entirely is important since, almost invariably, the assay is zero in Simond's cachexia" (4).

DEBILITY AS A RESULT OF MISCELLANEOUS CAUSES

Superficial and rather incomplete studies indicate that infection, surgical operations, anemia, and almost every sort of non-specific trauma lower the 17 KS excretion. However, the effect of non-specific trauma (alarm reaction) on the organism is said to be associated with adrenal hyperplasia and increased urinary excretion of cortin by biologic assay. Thus 17 KS excretion under these conditions is not a measure of cortical hormone production. This fact has been explained by the hypothesis that "17 KS derived from the adrenal cortex only appear in urine in increased amounts when the production or that of their precursors is increased out of proportion to the need for them" (4).

LIVER DISEASE

Low values are frequently found in liver disease. Steroids are for the most part not excreted in free form. Conjugation probably occurs in the liver. In liver disease, therefore, 17 KS assays may be low because of failure of conjugation. Liver disease further may effect steroid metabolism by its effect on fat absorption (4).

HYPOADRENOCORTICISM (ADDISON'S DISEASE)

Assuming that all urinary 17 KS are derived from the male gonads and adrenal cortex, and if the average normal excretion for females is 9 mg. and

for males 14 mg., one might assume that 9 mg. are derived from the adrenal cortex in both men and women, and 5 mg. from the male gonads. Female patients with Addison's disease would then be expected to have a negative assay result. One would expect male patients with this disease to excrete 5 mg. or less, since the 17 KS output by the testes might be lowered by the general debility. In a series of 5 females and 3 males, it was found (Fraser, Farber, Albright, Sulkowitch and Reifenstein (4)) that the female patients actually did have negative assays, and the male assays were all below 5 mg. but not negative.

HYPERADRENOCORTICISM

The ketosteroid excretion of a group comprising 7 cases of pre-pubertal virilism was studied by Patterson, Jocelyn, et al. (7). Four of these cases were most interesting in that the adrenogenital syndrome was present in its most complete form, and each submitted to unilateral adrenalectomy, fully establishing the diagnosis of adrenal hyperplasia. The 17 KS excretion ranged from twenty to seventy times the normal excretion.

This same group of investigators found that in 4 cases of adrenal tumor the 17 KS excretion ranged from twenty-five to fifty times the normal levels. In view of this data and previously published results on adrenal tumor cases (8), it was felt to be impossible to differentiate between adrenal tumor on the one hand and adreno-cortical hyperplasia on the other, solely on the basis of urinary ketosteroid levels.

However, it has been pointed out, by Talbot, Butler, and MacLachlan (2) that "isolation of individual ketosteroids affords evidence favoring the adrenal cortex as the source of Beta KS, and both adrenal and gonadal secretion as the source of Alpha KS." This fact was felt to provide "specific diagnostic criteria for the differentiation of adreno-cortical hyperplasia and adreno-cortical carcinoma." Patients with apparent adreno-cortical hyperplasia excreted approximately six times the Alpha, Beta, and total neutral KS excreted by normal subjects of corresponding age groups. In patients (2 cases) with carcinoma of the adrenal cortex the total neutral KS excretion was many times the normal amount, from which an abnormally high percentage of Beta KS was isolated. It was concluded that "markedly elevated excretion of Beta neutral KS is diagnostic of adrenal cortical carcinoma; however, a normal or slightly elevated output does not rule out this diagnosis."

Fifty-seven cases of post pubertal virilism were investigated by Patterson, Jocelyn et al. (7). The 17 KS excretion in these cases covered a fairly wide range, from 6.4 mg. a day at the lowest to 33.4 mg. at the highest. Less than half the cases showed findings clearly in excess of the normal range. In such instances the 17 KS determinations fail to detect any abnormality in

cases which show reliable clinical evidence of adrenal hyperfunction (Cushing's Syndrome). Similar values were reported by other investigators (2, 4). Fraser, Forbes, et al. pointed out that even a normal value becomes significantly high when the debility, which all these patients have, is considered.

PANHYPOPITUITARISM

Panhypopituitarism is a condition in which there is absence or underfunction of all the hormones of the anterior pituitary gland. This includes dwarfism and Simond's cachexia. Since the pituitary stimulates both adrenal cortex and gonads, a low excretion of urinary 17 KS might be expected in these conditions. All 15 cases of panhypopituitarism studied by Fraser, Forbes, et al. gave very low values for urinary 17 KS; in fact, only 2 showed any 17 KS in the urine at all (4).

ACROMEGALY

Acromegaly is associated with marked hypertrophy of the adrenal cortex and a markedly increased biologic assay for cortin in the urine. One might think that this condition would yield an increased 17 KS output. However, in 6 cases studied by Fraser, Forbes, et al. this was found not to be the case. The assays were either normal or a little low. It was suggested that the hypertrophy is compensatory, and that any increased need for cortical hormones decreases the 17 KS output (4).

MALE HYPOGONADISM (NOT CAUSED BY PANHYPOPITUITARISM)

Accepting the hypothesis that the 17 KS are derived from male gonads and adrenal cortices, the values in a male castrate should fall into the normal female range. Eunuchoidism caused primarily by gonadal underfunction has been studied by Fraser, Forbes, et al. (4). The 17 KS values were in the range of normal females and the FSH tests were positive. Cases of eunuchoidism as a result of panhypopituitarism had negative FSH tests and negative values for 17 KS.

OVARIAN DISORDERS

Hamblin et al. (9, 10, 11, 12) studied the urinary excretion of 17 KS in various ovarian disorders. It was found that "diverse grades of corpus luteum hormone function, ranging from normal to the absence of progesterin secretion, per se have no effects upon the level of 17 KS excretion. This fact was taken to be evidence that progesterin does not enter into any close reciprocities with the adrenal androgens." In other words, simple corpus luteum failure of the ovaries is followed by no secondary hyperactivity of the adrenal cortex (10). A study was done of the 17 KS excretion in women with

intercurrent amenorrhea during the climacteric and after artificial menopause. It was found that there was an increased 17 KS excretion early (12, 13), but during the later stages of sexual aging stabilization of the adrenopituitary axis occurs and the KS output reaches normal levels (12, 4, 14).

Fraser, Forbes, et al. (4) found that one patient with virilism as a result of arrhenoblastoma had a 17 KS assay within normal range, as did one patient with virilism caused by disgerminoma. It was felt that these tumors produced a steroid which is not excreted as 17 KS.

HYPERTHYROIDISM AND HYPOTHYROIDISM

In primary hypothyroidism, untreated, 17 KS assays have been found to be always low and sometimes zero. Cases of hyperthyroidism show values on the low side, but this may be the result of secondary factors such as malnutrition, rather than hormonal imbalance (4).

DIABETES MELLITUS

"There is no reason to believe that disorders of the Islands of Langerhans should have any effect on the 17 KS output." Six cases reported by Fraser, Forbes, et al. (4) had rather low 17 KS values, but normal considering nutrition and infection.

17 KS EXCRETION AND CANCER

In view of the close structural similarity of carcinogenic hydrocarbons and steroids, the study of steroid excretion in cancerous and non-cancerous persons appeared fruitful to a number of investigators. Pearlman (15) reported that non-cancerous persons excreted significantly higher total 17 KS than do cancerous persons, and a markedly higher Beta KS output than cancerous persons. He found that non-cancerous males excreted roughly twice as much 17 KS as do non-cancerous females. On the other hand cancerous males and females tend to excrete approximately the same amount of neutral KS. This study was made on males with carcinoma of the intestines and bladder and on females with carcinoma of the breast and uterus. No known or suspected case of malignancy of the adrenal cortex was included.

Satterthwaite, Hill, and Packard (16) studied the excretion of 17 KS in the urine of patients with prostatic carcinoma. The average level of excretion was found to be low but within the normal range of variation for elderly men without prostatic carcinoma. However, they found that, in cases in which bilateral orchidectomy was done for inoperable carcinoma of the prostate, the clinical improvement was correlated with the percentage of decrease in the 17 KS. Maximal improvement after orchidectomy was noticed to occur in patients who had the greatest drop in the 17 KS output. It was felt that patients who do not show marked decrease after orchidectomy in

the 17 KS output may expect little benefit from the operation and estrogenic therapy should be tried.

Scott and Vermuelin (17) also reported on 17 KS excretion in prostatic carcinoma. The fall in 17 KS output following castration was noticed, but it was also noted that this fall was only temporary and was followed by a gradual rise in 17 KS output. The duration of the rise was not determined. Factors mentioned for causing the decrease were operative trauma, anaesthesia, and removal of the testes. The postcastrational rise was explained by general improvement of the patient's condition and compensation for gonadal secretory deficiency by increased adrenal activity.

EFFECT OF HORMONE THERAPY ON 17 KS EXCRETION

It is believed that 17 KS assay is of value not only in diagnosis but also in following the effect of therapy.

DESOXYCORTICOSTERONE ACETATE

Cuyler and his associates ran 17 KS levels on patients with Addison's disease who were being treated with desoxycorticosterone acetate. This therapy was associated with a decrease in 17 KS output. This finding is not in agreement with Fraser and his group (4), who found a very slight increase in 17 KS values during administration of D.C.S. The difference may be accounted for by the status of the patients. There was no evidence that D.C.S. acetate was excreted as 17 KS.

Cuyler and associates presented evidence that in Addison's disease the 17 KS level varies inversely with the dosage and extent of therapy. "This correlation may prove to be an indication of pellet exhaustion before clinical signs and symptoms reappear. The level of 17 KS excretion was found to increase as exhaustion of the implanted pellets progressed."

TESTOSTERONE PROPIONATE

Since patients with panhypopituitarism do not excrete 17 KS before treatment, Fraser and his group (4) felt that assays on these patients would give the best indication of the excretion as 17 KS in the urine. It was felt that the dose of testosterone required for full replacement therapy in eunuchoidism might be regulated by the 17 KS levels. It was noted that 23 mg. doses 3 times a week resulted in 17 KS values within the lower range of normal.

SUMMARY

In summarizing these results it would seem that value of 17 KS determinations as a laboratory aid to diagnosis is limited to special cases. In combination with other determination and with clinical evidence, 17 KS assays may give valuable confirmatory assistance in reaching a diagnosis.

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DEPARTMENT OF OBSTETRICS

CASE REPORT

The patient, a 25-year, white, para 1-0-0-0 was first seen on August 17, 1946. Her family history was negative for significant disease, and she had had no serious illness. In May 1945 she was delivered of an eight pound four ounce living child by breech extraction. The baby died after 15 minutes, the cause of death being undetermined. During this pregnancy her prenatal course had been uneventful and her puerperium was normal.

The patient's menstrual periods had always been regular, with a 28-day cycle. Her last period was on May 11, 1946 making her estimated date of confinement February 18, 1947. Therefore, when first seen, according to this history the duration of her pregnancy was no more than twelve weeks. Since her last period she had had continuous nausea but no vomiting. There had been a slight amount of "black" vaginal discharge which had become blood streaked during the last three weeks. There had been no pain. She had noticed some increase in the size of her breasts associated with a watery secretion from the nipples. She had not felt fetal activity, but she did notice that her abdomen had become much larger during the three weeks prior to August 17.

The patient was somewhat obese weighing 153 pounds. Her blood pressure was 150 systolic over 85 diastolic. The general examination was otherwise negative. There was a round, soft mass extending from the symphysis to the umbilicus, the distance from the symphysis to the top of the mass being 16 centimeters. It was symmetrical, not tender, and felt somewhat cystic. Fetal parts could not be palpated nor could a fetal heart be heard. Inspection of the cervix was normal and there was no evidence of a cervical discharge. Inspection of the vaginal mucosa was normal. On bimanual examination, the cervix was extremely soft with the external os easily admitting one finger. The uterus was symmetrically enlarged and felt more firm than did the abdominal mass. However it was felt that the large abdominal mass was definitely uterus. There was no sensation of ballotment in the mass. Laboratory examinations at this time were: urinalysis negative-hemoglobin 11.9 grams (82%). The patient was Rh₀ negative, in blood group B, and her B.M.R. was plus 20. Her husband was Rh₀ Positive.

Diagnosis: The salient features of this case are: amenorrhea of three months duration, a rapidly growing abdominal mass which by examination appears to be uterus, intermittent vaginal bleeding, and some of the commoner presumptive signs of pregnancy. At the time of this examination, the patient by history should have been in about the twelfth week of her pregnancy but the fundus of the uterus was 16 centimeters above the symphysis which would be compatible with a 22-weeks pregnancy. Of course it is theoretically possible, although rare, for apparently normal menstrual periods to occur during pregnancy until the decidua vera and capsularis fuse at the fourth month. Therefore, the patient might well be in the second trimester of her pregnancy. The inability either to palpate fetal parts or to hear a fetal heart is significant, but in an individual who is somewhat obese it is oftentimes difficult to identify the fetus definitely at 22 weeks or to locate the fetal heart tones. Also the fact that the patient had not felt fetal activity is not too significant because frequently the movements of the baby are not felt until beyond the 22nd week. An effort was made to visualize a fetal skeleton by roentgenography but the flat plate of the

abdomen showed only a symmetrical, low abdominal mass. This is strong evidence against a normal intrauterine pregnancy, for it is generally possible to detect the fetal skeleton after the fifteenth to the eighteenth week. A quantitative Friedman test was carried out which gave a positive result with urine dilutions of 1:50. Therefore, a tentative diagnosis of hydatid mole was made.

Treatment: Blood was made available for the patient and under sterile technique using gas oxygen anaesthesia, a pelvic examination was made. The cervix being soft and the external os patulous, the canal was easily dilated with the fingers until two fingers could be introduced inside the uterus. An extremely soft, friable mass could be felt and fragments of it were brought from the uterus between two fingers. The fragments proved to be made up of small, soft, translucent bodies about the size of a pea. The diagnosis of hydatid mole being established, the uterus was then evacuated by ovum forceps of a tremendous amount of this cystic material. A moderate amount of bleeding was associated with the procedure but the uterus contracted well. Digital examination of the uterus was carried out and the cavity appeared clean. A small pack was inserted in the uterus and this was removed the following day. The patient received ergotrate and pituitrin following evacuation of the mole and there was no unusual postoperative bleeding. The report of the microscopic examination of the specimen was: "Section of placental tissue shows hydropic chorionic villi which show moderate proliferation of the trophoblast. There is an absence of chorionic vessels. A small amount of decidua is seen. Diagnosis: Hydatid Mole."

DISCUSSION

The etiology of hydatid mole is unknown. It occurs about once in every 2500 pregnancies, although small areas of vesicular degeneration of the placenta are often overlooked. It occurs most frequently between ages 25 and 35 and it has been known to recur in subsequent pregnancies. It may be complete or partial, the latter being associated with some fetal development. Cases have been reported of the delivery of a full term living child and a mole. The chief symptom is the appearance of vaginal bleeding during the third to fifth month associated with a rapid increase in the size of the uterus. However, the uterus may be smaller than expected and cases of moles going to term have been reported. Inability to outline the fetus or to hear the fetal heart at a time when these signs should normally be present are important diagnostic aids. The inability to visualize the fetal skeleton by roentgenology after the eighteenth week is evidence in favor of hydatid mole. A positive Friedman Test will arouse suspicion for it indicates the excretion of large amounts of gonadotrophic hormone, a circumstance associated with pregnancy, hydatid mole and chorioepithelioma in the female. Furthermore, the concentration of this hormone is extremely high in the last two conditions so that the test may be carried out quantitatively in which case high dilutions—1:50, 1:100, or 1:200—of urine may give a positive results. These quantitative tests are of reduced significance if carried out at about the fortieth day of pregnancy for at this time the urinary excretion of gonadotrophic hormone in normal pregnancy is very high.

Occasionally the patient will expell the characteristic, translucent, grape-like vesicles and thus to an extent establish the diagnosis. However the diagnosis cannot be definite until the specimen has been examined microscopically and its true character determined.

The treatment of hydatid mole is evacuation of the uterus as soon as feasible after the diagnosis is made. This can almost regularly be carried out from below. The cervix is slowly dilated with the fingers or by instruments until two fingers can be admitted. The growth is then separated from the uterine wall and either expressed or removed with ovum forceps or the fingers. All manipulations must be carried out very carefully, for the uterine wall is usually very thin and easily perforated. A curette should not be used. Following removal of the mole, the uterus should be packed. The pack will serve to minimize bleeding and when it is removed in 24 hours any fragments left behind may adhere to the pack. When the pack is removed, circumstances should be proper for the insertion of another should excess bleeding occur. Rarely is abdominal removal of the mole necessary and less often is hysterectomy indicated, although in a woman nearing the menopause, the latter may be justified. Quite frequently the mole will be expelled spontaneously following which the uterus should be digitally explored for remaining fragments.

The immediate dangers in the treatment of this condition are (1) perforation of the uterus, (2) hemorrhage, and (3) infection. The first may be prevented by gently carrying out the evacuation of the uterus and the avoidance of curettes. Hemorrhage may be unavoidable so that blood should be available for the patient in the operating room. Postoperative packing of the uterus will lessen this danger. The risk of infection may be reduced by carrying out all procedures under scrupulous asepsis, replacing blood loss, and perhaps penicillin prophylactically. The remote danger lies in the possibility of the development of chorioepithelioma, one of the most highly malignant of neoplasms. About one per cent (Novak) of hydatid moles become malignant. Therefore, the patient should be followed for at least one year or eighteen months and for this purpose, the biologic test above mentioned is used. It should be repeated at monthly intervals, and should become negative within four to six weeks following evacuation of the uterus and remain negative. A positive test after this time justifies a curettage and microscopic examination of the tissue. Persistent vaginal bleeding following evacuation of a mole should arouse suspicion. When the diagnosis of chorioepithelioma is made, a complete hysterectomy should be carried out. Metastases occur to the lungs, vagina, vulva, liver and brain and recent reports would indicate some regression of these metastatic lesions once the primary growth is removed.

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ONE HUNDRED AND FIFTY-FIRST PROGRAM MEETING

The One Hundred and Fifty-First Program Meeting was held on Wednesday, April 17, 1946 at 4:00 P.M. in the Library, third floor Bressler Building.

A paper on *Oral Penicillin with Basic Aluminum Aminoacetate* was presented by William E. Evans, Jr., of the Department of Pharmacology, School of Medicine.

ORAL PENICILLIN WITH BASIC ALUMINUM AMINOACETATE

WILLIAM E. EVANS JR.

Basic aluminum aminoacetate appears to be suitable for the oral administration of penicillin. It is neutral and buffers gastric acidity to pH 4 to 4.5. While this work was in progress McDermott *et al.* successfully employed magnesium trisilicate in this manner.

Clinical work is now in progress using the combination in infections known to be susceptible to parenteral penicillin therapy.

ONE HUNDRED AND FIFTY-SECOND PROGRAM MEETING

The One Hundred and Fifty-Second Program Meeting was held on Wednesday, May 22, 1946, at 4:00 P.M., in the Library, third floor Bressler Building.

A paper on Blood and Urinary Phenols was presented by Emil G. Schmidt and Jane L. Banker of the Department of Biochemistry, School of Medicine.

All Program Meetings are Open to the Public.

BLOOD AND URINARY PHENOLS*

E. G. SCHMIDT AND JANE L. BANKER

An analytical method for blood and urine phenols was described in which these bodies are extracted with ether at selective pH and then determined directly in the various ether extracts with diazotized p-nitroaniline. The ether-soluble phenolic bodies of the urine are separated into seven groups: free, conjugated, and total phenols; free, conjugated, and total aromatic hydroxy acids; and finally, total phenolic bodies. An important innovation, dilution with alcohol, made possible the determination of these compounds directly in the ether extract. The formation and excretion of phenolic bodies was not appreciably influenced by dietary changes unless protein was rigidly excluded.

Several methods for determining the "diazo value" of blood were studied and evidence was presented that the generally accepted value for blood phenols (1 to 2 mg. per cent) is too high. An ether-extraction method for blood phenols was described and it was found that blood actually contains 0.055 to 0.12 mg. per cent phenols.

*From the Department of Biological Chemistry, University of Maryland, School of Medicine.

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RECEPTION FOR MRS. BRISCOE

On June third, the Faculty of the School of Medicine gave a tea in the Board Room of the University Hospital to honor Mrs. Ruth Lee Briscoe, retiring after thirty-two years as Medical Librarian. The Board Room and adjoining lounge were well decorated with flowers for the occasion, and at the far end was set a beautifully prepared refreshment table. Another table was piled with letters, telegrams, and gifts from people who could not be present.

After the many guests had been through the receiving line, General Robert U. Patterson, Dean of the School of Medicine, presided at a presentation ceremony which paid the highest tribute to Mrs. Briscoe.

This ceremony began with a speech by Judge Allan W. Rhynhart, representative of the Governor who had been detained by affairs of state. His offering was the official state certificate of retirement.

Mr. Carl W. Hintz, Director of Libraries of the University, presented a richly bound volume of letters written in tribute to Mrs. Briscoe by alumni and other friends, not only throughout the United States, but from foreign territory as well.

A personal gift of jewelry, as a token of affection from the staff of the Medical-Dental-Pharmacy libraries, was presented by Mrs. Robinson.

Dr. Arthur M. Shipley, as senior member of the Faculty of Medicine, turned over to Mrs. Briscoe, with appropriate remarks, a check for five hundred dollars, gift of the faculty and alumni.

General Patterson then conferred upon Mrs. Briscoe the title of "Medical Librarian Emeritus," as unanimously voted by the faculty.

Finally, Mayor Theodore R. McKeldin made a surprise presentation of a numbered etching of "Washington Monument in Winter," as the gift of his office and of the people of Baltimore.

In acknowledging the honors paid to her, Mrs. Briscoe made this characteristically friendly response:

"On one of the tables in the parlor of my home, there is a small framed picture of a noted beauty of a by-gone day: Mary, Queen of Scots, an historic character. My old colored cook picked it up one day and said to me: 'Mis' Briscoe, is this you?' I make the allusion by way of comparison; because, after the festivities of today, your precious gifts and kind words which have been spoken, I rub my eyes to see whether this be I, or a more exalted individual from a former incarnation.

"Farewell is a sad word and I cannot say it, for I shall still be available. I press you to my heart with deepest gratitude and affection. I love you all. And I shall always be as I now am: your very own Mrs. Briscoe."

NEWS ITEMS

Dr. C. H. Hemphill (Class of 1913) has recently returned to private practice at Highlands, N. C. after being employed during the war by the DuPont Company in its Medical Departments at Pasco, Washington, and at Las Almas, New Mexico.

Governor Meadows of West Virginia announced that Dr. Newman Houghton Dyer, Class of 1926, succeeded Dr. J. E. Offner as state health commissioner. Dr. Dyer, 52, a native of Webster Springs, attended West Virginia Wesleyan College and received his B.S. degree from West Virginia University before he undertook the study of medicine.

The Ohio Chemical and Manufacturing Company of Cleveland, Ohio, has awarded a \$5000 fellowship to the Department of Pharmacology School of Medicine, University of Maryland for the purpose of studying anesthetic agents. These grants have been in effect since 1938. Dorothy V. Kibler, M.S., is working on the problem under the direction of Dr. John C. Krantz, Jr., Professor of Pharmacology.

The Emerson Drug Company of Baltimore has awarded a \$5000 fellowship to the Department of Pharmacology, School of Medicine, University of Maryland for the purpose of studying the mechanism of action of drugs in hypertension. Elaine Gaby, A.B., is working on the problem under the direction of Dr. John C. Krantz, Jr., Professor of Pharmacology.

Dr. Harry K. Iwamoto was appointed Assistant Professor of Pharmacology in the School of Medicine of the University of Maryland, October 1, 1946. He had been a fellow in that department and is taking the place of Dr. William E. Evans, Jr., Associate Professor, who died a few months ago.

The first Doctor Julius Friedenwald Memorial Lecture will be given by Dr. George Eusterman. Dr. Eusterman is Professor of Medicine, Mayo Foundation, University of Minnesota and Head of the Section in Gastro-Esterology, Mayo Clinic. His subject will be "Newer Phases of Gastro-duodenal Ulcer". The lecture will be on Thursday, November 14, 1946 at 8:30 P.M. in the Chemical Hall, Main Building, of the University of Maryland, School of Medicine, N.E. corner of Lombard and Greene Streets, Baltimore, Maryland.

OBITUARIES

Doctor Sylvester V. Hoopman, Douglas, Arizona, P. & S. 1882, age 87, died April 23, 1946, of cardiac failure and arteriosclerosis. Dr. Hoopman was professor of Nervous Diseases at the College of Physicians and Surgeons from 1884 to 1888. He did postgraduate work in London, Vienna, and Berlin, and was in active practice for over 55 years.

DR. DANIEL C. PATTERSON

Dr. Daniel C. Patterson (Class of 1906) died on September 12 in an automobile accident, apparently resulting from a heart attack which caused him to lose control of the car.. Dr. Patterson received his high school education at the Bulkely School in New London. After taking his M.D. at the University of Maryland, he interned first at Mercy Hospital in Baltimore and then in the Bridgeport, Connecticut, Hospital. During the first World War he served with the Maryland Unit in France and was discharged with the rank of captain. At the time of his death, a few weeks before his 64th birthday, he was attending surgeon at the Bridgeport Hospital.

Dr. Patterson was a member and one time president of the Fairfield County Medical society, the Connecticut Medical society, the New England Surgical social, and was surgical examiner for the Connecticut State Board of Surgical Examiners. He belonged to the America Medical Association, the American Association for the Surgery of Trauma, the New York Academy of Medicine, and was one of the founders of the American Board of Surgery. He wrote numerous articles on medical and surgical subjects.

DR. J. R. PADDISON

Dr. John R. Paddison (class of 1902) died in Kernersville on July 20, 1946, after a brief illness. He was 68 years old and retired. After graduating from the University of North Carolina, he attended the University of Maryland. He entered practice in August 1902, as resident physician at the Oak Ridge Military Institute, and opened an office in Kernersville in 1908. He was a member of the Forsyth Medical Society, and served as its president in 1924. In 1926 he was president of the district medical society. Dr. Paddison is deeply and sincerely grieved by all those who knew him as kindly, responsible and unassuming.

DR. A. M. O'BRIEN

Dr. A. M. O'Brien, aged 73 (P. and S. 1899) died in Pittsburgh, at the Mercy Hospital, on May 2, 1946. He graduated from Holy Cross College in 1897, and attended medical school at the University of Maryland College

of Physicians and Surgeons. He interned at Maryland General and Maryland Lying In Hospital, and at Bellevue Hospital in New York City. In July, 1901, he entered practice in association with the late Dr. J. H. Reed. During the first World War he was commissioned and served in France as a surgeon in the 165th Field Hospital Corps of the 42nd Division's 167th Artillery, and became a captain before mustering out and returning to practice. He entered the hospital two months before his death.

Adkins, Elmer Hall, Miami Beach, Fla.; class of 1905; aged 63; died, recently, of coronary occlusion.

Allison, Robert Glenn, Minneapolis, Minn.; class of 1912; aged 58; died, March 20, 1946, of cerebral hemorrhage.

Ayars, Emerson Winfield, Coconut Grove, Fla.; P & S, class of 1895; aged 79; served during World War I; died, April 2, 1946, of coronary thrombosis and myocardial rupture.

Barrow, Craig, Savannah, Ga.; class of 1900; aged 69; served during World War I; died, August 31, 1945, of cerebral hemorrhage.

Bolin, Grover Cleveland, Orangeburg, S. C.; class of 1908; aged 61; died, March 16, 1946, of coronary thrombosis.

Bowen, William David, Richmond, Va.; P & S, class of 1893; aged 78; died, May 15, 1946, of heart disease.

Bowen, William Wallace, Glens Falls, N. Y.; B.M.C., class of 1907; aged 63; died, April 26, 1946, of coronary thrombosis.

Boyer, Perry L., Col., U.S.A. (retired), Alexandria, Va.; class of 1899; aged 68; served during World War I; died, April 17, 1946, of right paranephric abscess.

Coppedge, Thomas O., Nashville, N. C.; P & S, class of 1908; aged 64; died, March 13, 1946, of coronary thrombosis.

Corbitt, Robert Wylie, Parkersburg, W. Va.; B.M.C., class of 1905; aged 64; died, April 11, 1946, of cerebral hemorrhage.

Delaplane, Arleigh Clinton, Cincinnati, O.; B.M.C., class of 1902; aged 66; died, February 13, 1946, of coronary thrombosis.

England, Welch, Parkersburg, W. Va.; class of 1926; aged 44; served during World War II; died, April 29, 1946, of heart disease.

Evans, James, Los Angeles, Calif., B.M.C., class of 1897; aged 79; died, March 20, 1946, of uremia.

Glass, Robert McCheyne, Winchester, Va.; class of 1901; aged 67; died, March 18, 1946, of angina pectoris.

Heise, Frederick, Trudeau, N. Y.; class of 1907; aged 62; died, June 8, 1946, of carcinoma of the kidney.

Hoffman, James Dickson, Grove City, Pa.; B.M.C., class of 1905; aged 65; died, March 11, 1946, of heart failure.

- Jenkins, William Romulus**, Franklinton, N. C.; class of 1943; aged 28; died, February, 1944, at Fort Bragg, of acute cardiac failure.
- Kennedy, Robert Lawson**, Panama City, Fla.; class of 1910; aged 57; died, May 10, 1945, of coronary occlusion.
- Kerr, Norman Lester**, Scottdale, Pa.; P & S, class of 1913; aged 62; served during World War I; died, January 22, 1946, of angina pectoris.
- Kinzer, George S.**, Ickesburg, Pa.; P & S, class of 1892; aged 76; died, February 28, 1946.
- Knowles, Frederick Edwin**, Boonton, N. J.; P & S, class of 1906; aged 68; died, May 6, 1946, of ruptured esophageal varices and cirrhosis of the liver.
- Newell, Rufus Ingalls**, Oakland, Calif.; P & S, class of 1902; aged 65; served during World War I; died, January 26, 1946, of abdominal carcinoma and arteriosclerosis.
- O'Brien, Augustus Michael**, Sharon, Pa.; B.M.C., class of 1900; aged 72; served during World War I; died, May 2, 1946, of acute mesenteric thrombosis.
- O'Malley, William Francis**, Monokin, Md.; class of 1916; aged 59; died, February 12, 1946, of acute dilatation of the heart and chronic interstitial nephritis.
- Reynolds, John Henry, Jr.**, Akron, Pa.; class of 1936; aged 34; found dead, March 25, 1946.
- Rivers, Wilfred J.**, Eastiver, S. C.; class of 1885; aged 82; died recently.
- Roberts, Eldred Andre**, Baltimore, Md.; class of 1929; aged 49; died recently.
- Snedden, Claude M.**, Long Beach, Calif.; B.M.C., class of 1904; aged 65; died, May 21, 1946, of coronary thrombosis.
- Stephens, Charles Manfred**, Waycross, Ga.; class of 1914; aged 62; died, February 25, 1946, of cerebral hemorrhage.
- Tubbs, Arba Brown**, Cadiz, O.; P & S, class of 1897; aged 75; died recently, of arteriosclerotic heart disease.
- White, Carl C.**, Mathews, Va.; B.M.C., class of 1897; aged 77; died, February 3, 1946, from a fracture of the hip incurred in a fall.
- Willse, Raymond Gerard**, Baltimore, Md.; class of 1909; aged 63; died, March 16, 1946, of acute pulmonary edema and coronary thrombosis.

VOLUME 31

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UNIVERSITY OF MARYLAND

JANUARY, 1947



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BULLETIN

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No. 4

TREATMENT OF ACUTE SULFADIAZINE ANURIA BY CONTINUOUS PERITONEAL LAVAGE; A CASE REPORT*†

JOHN P. DOENGES M.D. AND CHARLES STRAHAN, JR. M.D.

Baltimore, Md.

INTRODUCTION

The syndrome of uremia forebodes a grave prognosis and the hope for adequate treatment fades before inadequate therapeutic measures. With this in view, potentially reversible renal lesions demand intensive and even radical methods of therapy. In this category would fall such lesions as transfusion reactions, chemotherapy anuria, heavy metal poison, surgical and massive trauma, toxemia of pregnancy and certain forms of acute glomerular nephritis. The case under discussion should be considered as a renal insufficiency resulting from chemotherapy.

The use of the peritoneum as a dialysing membrane, to remove the protein metabolites, is a form of clinical procedure not commonly employed to combat uremia. However, it is not a new means of treating the uremic state. Early experimental work (2) on dogs demonstrated that nitrogenous products were removed from the circulating blood by artificial dialysis. Ganter, (11) in 1923, was the first to use this therapeutically, substituting the peritoneal surface for an artificial dialytic system. He noted that when the ureters were ligated and normal saline was injected intraperitoneally there was a fall in the high blood urea. Other investigators (14, 18, 23) improved and added to the method of Ganter by using continuous peritoneal lavage and showed that more urea could be removed by dialysis than could be excreted by the kidney in the same period of time. Balazs and Rosenak, (4)

* From the Department of Medicine, Mercy Hospital.

† Received for publication October 10, 1946.

in 1934, treated two cases of bichloride of mercury poisoning with an appreciable reduction in non-protein nitrogen, but with fatal outcomes because of irreversible kidney damage. Further experimental studies were made by Wear, Sisk and Trinkle (25) in the hope of finding a more satisfactory perfusion fluid. With the same end in view, Abbott and Shea (1) suggested a modified Tyrode's solution which thus far has proved the most satisfactory lavage medium for maintaining the normal chemical composition of body fluids. One case of recovery of sufficient renal function following sulfathiazole anuria by peritoneal irrigation has been reported by Frank, et.al.(10)

While there seems to be little hope that peritoneal lavage can replace renal function over a long period of time, it does appear possible that it may prove valuable in tiding a patient over a short period of renal insufficiency. In the case reported, all of the usual methods of restoring kidney function had failed, and in the face of total anuria and the rising of protein waste products in the blood, peritoneal lavage was instituted.

TECHNIQUE

The procedure here described is a modification of several methods previously reported. Using the equipment at hand, the technique most closely approximated that of Frank, et. al. (10) The lavage medium was prepared in 6000 liter pyrex flasks and autoclaved for 20 minutes at 265 F under 15 pounds of pressure. The solution, an adaptation of the solution of Abbott and Shea (1) was as follows:

Sodium chloride.....	6.10 gm.
Calcium chloride.....	0.23 gm.
Potassium chloride.....	0.35 gm.
Sodium phosphate (monobasic).....	0.07 gm.
Magnesium chloride.....	0.05 gm.
Sodium bicarbonate.....	2.20 gm.
Dextrose.....	10-20 gm.
Distilled water.....	1000 cc.

The sodium bicarbonate was added after sterilization of the solution. In addition to the above ingredients, 200,000 units of penicillin and 10 mg. of heparin were added to each 5000 cc. of the lavage solution.

The patient's abdomen was prepared surgically in the routine manner. Through a small stab incision in the upper left quadrant a small mushroom catheter was inserted into the peritoneal cavity. One stay suture through the subcutaneous tissue held this catheter in place. A similar, though somewhat larger incision was made in the lower right quadrant and a stainless steel "sump" type suction tip was cautiously inserted. Subcutaneous stay sutures and catgut skin sutures held the apparatus in place. The solution was placed in a large Erlenmeyer flask 4 feet above the abdomen

and a siphonage was established. This was then connected to the mushroom catheter with a drip chamber in the system so that a rate of flow could be determined. To the "sump" drain was connected a suction apparatus with a constant vacuum of 120 mm. Hg. All possible precautions were utilized to maintain sterile technique at all times. The rate of flow of the perfusion fluid was approximately 500 cc. per hour maintained over a 24-hour period. All lavage specimens were collected and sent to the laboratory for analysis of urea and protein content as determined by the methods of Karr (15) and Greenberg (12).

CASE HISTORY

A 62 year old white housewife entered the hospital on May 8, 1946 because of anuria.

Two weeks prior to admission, the patient developed a sore throat. She was seen by her local doctor and sulfadiazine, 2 grams stat. and one gram every 4 hours, was prescribed. She was advised to take sodium bicarbonate with her sulfa tablets and to drink a lot of water. In spite of therapy, on May 1st the patient began to feel much worse, complaining of cough, chills, fever, headache and generalized malaise. However, she continued to be ambulatory until May 5th. Since that time she had taken very little to eat, had been constipated and began to notice a decrease in her urine output. On May 7th she became totally anuric; however, there were no other symptoms referable to the urinary tract.

The past history was negative except that the patient was inclined to be nervous and had been taking medicine for her nerves. She had "passed out" two years ago from an unknown cause. As well as could be determined there was no history of any previous heart or kidney disease.

On physical examination the patient, an obese white female, was seen lying in bed, slightly nervous and apprehensive. The skin was warm, dry and presented a slightly cyanotic tinge. Respirations were somewhat rapid but not labored. The right cornea showed extensive scarring and neither pupil reacted to light and accommodation. The pharynx, uvula and nasopharynx were injected and edematous. The heart was slightly enlarged to the left, the sounds were distant and regular and no murmurs were heard. The lung fields were resonant to percussion but the bases descended poorly. Breath sounds were bronchovesicular and coarse rales were heard throughout the chest. The abdomen was distended with some dullness low in the flanks. There was tenderness on deep pressure in the right upper quadrant just below the costal margin and the liver was barely palpable. There was no discernible edema.

The temperature was 101 F., the pulse was 96, respirations 28, the blood pressure was 130 systolic over 90 diastolic.

At the time of admission the red cell count was 3,940,000 with 11.5 grams of hemoglobin. The white cell count was 11,650 with 88 per cent neutrophils. A catheterized urine specimen of 30 cc. gave an alkaline reaction, 2+ albumin, and microscopically showed 2 red cells and 2 white cells per high power field. There were no sulfa crystals seen. The blood urea was 77 mgm. per cent, urea N 35 mgm. per cent, sulfadiazine 21.6 mgm. per cent. The Kahn and Hinton tests were negative. Cephalin flocculation was negative for 24 hours and plus-minus for 48 hours. The sedimentation rate was 32.

On the day of admission the patient was given 2000 cc. of 10 per cent glucose and an enema, and hot water bottles were placed over the kidney area. She was given 20,000 units of penicillin every 3 hours. Catheterization 5 hours after this regime was started

obtained only 50 cc. of urine. A splanchnic block was done and novocaine was injected at L1 and L2 bilaterally. Catheterization 4 and 8 hours later showed no urine in the bladder. She was then given concentrated plasma and 20 per cent glucose, both of which failed to elicit any diuresis. Chest roentgenography at this time revealed a patchy infiltration in both lung fields and the heart appeared slightly enlarged. Ureteral catheters were passed without difficulty and no crystals were found in the bladder or ureters. Roentgen studies of the abdomen demonstrated the catheters in the renal pelves. The kidney shadows were normal and no stones were demonstrable.

On the 2nd hospital day peritoneal lavage was begun as previously described and a more or less constant perfusion was continued for the remainder of her hospital stay. The ureteral catheters were irrigated with warm distilled water every 4 hours, but this failed to stimulate the flow of urine and, when the catheters came out after 2 days, they were not replaced.

A careful check was kept on the blood sugar, chlorides, urea and urea N, total proteins, A/G ratio, cholesterol, creatinine, calcium and phosphorus (6, 8, 9, 12, 15, 24, 26) in an attempt to maintain the normal electrolytic balance. Initially the patient was put on a high protein diet in an attempt to prevent the formation of edema, but this was subsequently discontinued as many of the toxic substances in uremia are felt to be of protein origin. The patient was started on 6 mgm. of testosterone every day in an attempt to maintain a positive protein balance (3, 16, 21). On the 3rd day of peritoneal irrigation a marked fall in the blood chlorides was noted. Oral sodium chloride was given until a normal level was obtained. Fluctuations in the total plasma proteins were stabilized by repeated administrations of intravenous concentrated plasma. A constant tendency toward acidosis as shown by the CO_2 combining power was controlled by oral and parenteral sodium bicarbonate. In 3 days' time the blood urea had fallen to 11 mgm. per cent; however, it again rose rapidly to a level somewhat over 100 mgm. per cent, and this level was maintained until death, showing some daily fluctuations (Chart No. 1). Elevation of the blood phosphorus level to 6.1 mgm. per cent with a concomitant fall in the calcium to 7.1 mgm. per cent was found to be characteristic of the uremic state (7). Eight days after lavage was instituted the blood sulfadiazine level fell from 21.6 mgm. per cent to 3.9 mgm. per cent. A gradually developing normochromic anemia was observed and the patient was transfused with 500 cc. of fresh whole blood. The urinary output did not exceed 34 cc. for any one day (Chart No. 2). The specific gravity of this urine varied between 1.007 and 1.015. Albumin ranged from a trace to 4+. Two to 3 red blood cells per high power field were an almost constant finding. The lavage fluid showed a relatively high concentration of urea and urea N (Chart No. 1). Cultures of peritoneal washings on the 5th day showed a growth of *B. coli*. Cultures from the incisions for insertion of the tubes showed a species of *B. alcaligenes*.

The blood pressure ranged from 130 systolic over 90 diastolic on admission to as high as 154 systolic over 74 diastolic, and then gradually dropped as the patient's general condition declined. At no time was it markedly elevated.

On the 2nd hospital day the patient's temperature spiked to 104 F. and she became cyanotic. With penicillin therapy the temperature gradually subsided and the respirations became less labored. However, her entire hospital course was marked by a rather septic type of temperature and pulse, and terminally the temperature again rose to 104 F.

On the 4th day of lavage the patient's general appearance had improved sufficiently so that she was taken to the operating room and a bilateral splanchnic block was repeated. No effect on urinary output was noticed. Repeated doses of 10 per cent glucose given parenterally failed to stimulate diuresis. Aminophyllin, calcium gluconate and vitamin B complex were also administered intravenously.

Retinal examination on the 5th hospital day showed edema, localized mainly around the nerve head. At this time also the patient began to develop edema which rapidly became more extensive, so that it reached proportions of anasarca. The extent of the edema showed some fluctuation but was a constant finding until the time of death.

She complained of considerable abdominal pain in the latter stages of the lavage. Abdominal distension became a major problem but it was amenable to enemas and proctigmine. On the 12th day of peritoneal lavage the mushroom catheter and the "sump" drain were reinserted because she complained of marked tenderness around the points of insertion, the drainage had slowed down to several hundred cubic centimeters per day, and there was considerable leakage around both inlet and outlet tubes. It was felt that adhesions had formed around the original sites of insertion. On the second occasion the mushroom catheter was placed in the right upper quadrant and the "sump" drain in the lower left quadrant. At this time a general anesthetic (nitrous oxide) was necessary for implanting the tubes. At the same time a cannula was placed in the saphenous so that the introduction of intravenous fluids was expedited. She remained mentally alert until the 14th day of irrigation, and then as the uremic state gradually progressed, her consciousness became increasingly cloudy.

As the urinary output did not return to normal, the patient showed a gradual though steady decline. The pulse became weak and thready and the respirations shallow and irregular. The blood pressure dropped to 80 systolic over 50 diastolic despite constant intravenous therapy. On the 19th hospital day the patient expired. A postmortem examination was not done.

DISCUSSION

The efficacy of peritoneal lavage is dependent upon the ability of the serosa to act as a semi-permeable membrane across which the urinary constituents may be excreted. Whereas a single "uremia toxin" has never been isolated it would seem probable that uremia is a complex auto-intoxication with various urinary products, largely, end-products of protein catabolism. The retention of urea, guanidine, creatinin, indican and inorganic substances such as potassium, magnesium, sodium and phosphates (7) all play a rôle in the development of the clinical aspects of uremia. Since these products are all dialyzable (1, 11) it would then logically follow that peritoneal lavage is applicable in those patients unable to excrete these substances through the normal channels.

According to Abbott and Shea (1) the lavage solution should have the following qualifications: 1. It should permit a maximum diffusion of waste products into it; 2. It should not alter the normal electrolyte pattern of the extra-cellular fluid; 3. It should have the desired tonicity; and 4. It should be a solution which affords nutrition and thus keeps protein catabolism at a minimum. Such a solution should not alter the state of hydration, as one would expect free passage of both electrolytes and water across the dialyzing membrane. A modified mammalian Tyrode's solution seems best to fit the above criteria and so was the solution of choice in this case. It is worthy of note that the presence of sodium bicarbonate in the solution not only stabilizes the diffusion of this substance from the blood but, in addition, aids

in combatting the acidosis which commonly accompanies uncontrolled uremia.

The complications of this procedure are not numerous but they may be of serious consequences. Of prime importance is the avoidance of peritonitis. Contamination may occur from such sources as: improperly sterilized solutions and apparatus; poor technique and handling in the changing and refilling of the reservoir; from room air through the "sump" drain or from the skin and along the tracts made for the insertion of the tubes; and by passage of the organism through the bowel wall by diapedesis. In connection with the last mentioned point, a certain amount of ileus, which was a constant finding, would promote migration of the organism. Whether the ileus was a complication of the lavage, a result of low grade peritonitis, or a result of the uremic state could not be determined; however, ileus is not an uncommon finding in uremia treated by other methods. As a prophylactic measure, 200,000 units of penicillin was used with each 5000 cc. of lavage fluid, and this apparently kept the peritoneal cavity relatively free of bacteria until the terminal stages of the illness when it was felt that peritonitis had developed despite all precautions.

It is apparent that the constant perfusion of a slightly hypertonic solution through the peritoneal cavity would have a sclerosing effect on the lining membrane. Because of this, 10 mgm. of heparin was placed in each 5000 cc. of fluid in the hope of preventing the formation of extensive adhesions (19). Without postmortem examination there is no way to determine the usefulness of such a procedure; however, as the lavage almost ceased to run through the abdomen on the 12th day, it was postulated that adhesions had developed around the original sites of insertion of the tubes, and the tubes were reinserted.

Depletion of essential metabolites is another complication deserving consideration. The water soluble vitamins are readily lost across such a semi-permeable membrane, thus requiring replacement by the parenteral route. It has been shown (22) that the blood sugar can be substantially reduced by such a procedure and it is conceivable that essential amino acids could likewise be lost from the circulating blood.

The development of edema and the changes in the electrolytic balance are the remaining major complications. In this case the question arose as to whether it would be more desirable to try to elevate the blood proteins, or to allow the patient to become edematous. On the one hand, to elevate the blood protein in the usual manner would tend to increase the products of protein catabolism, whereas edema could definitely impair intra-cellular function. An original attempt to maintain the blood proteins at a high level through diet was abandoned and a middle course was followed. Terminally the edema became quite extensive, but the plasma protein was

maintained at a level somewhat above 6 mgm. per cent with an A/G ratio varying between 1.4 and 1.6. Testosterone did not seem to be of any great value in preventing the formation of edema, and it seemed evident that the protein balance was disrupted. The maintenance of the electrolytic balance does not constitute a major problem if adequate laboratory studies are

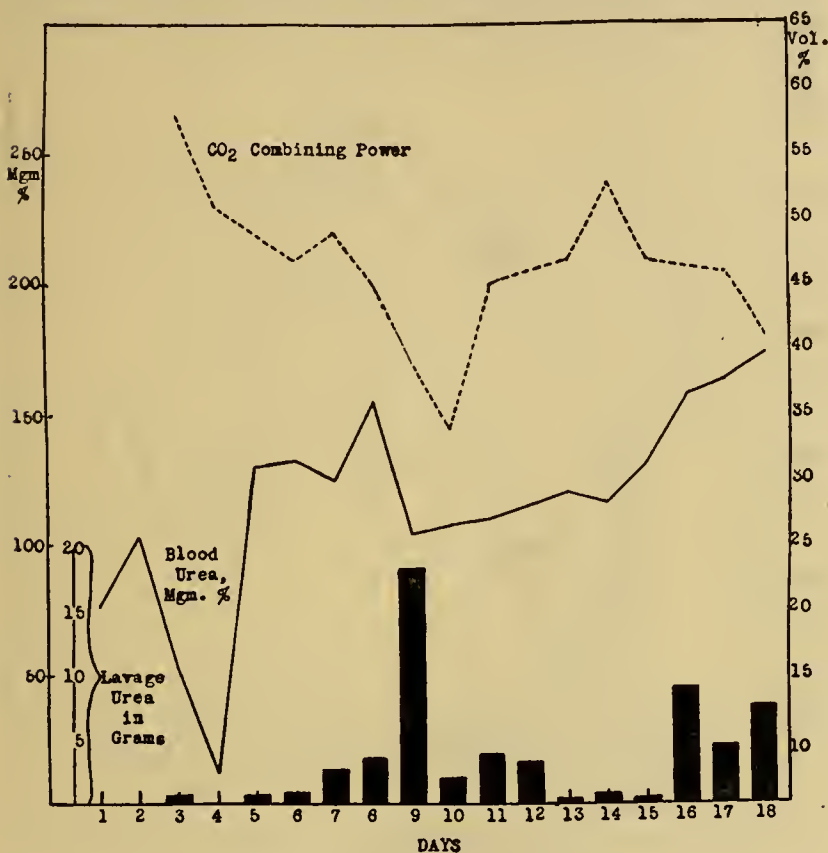


CHART 1. Relationship between CO₂ combining power, blood urea and excretion of urea in the lavage fluid.

made and used as a guide for further therapy (See Charts 1 and 3). Deficiencies can readily be supplemented by the oral and parenteral routes.

The amount of urea, urea N and creatinine excreted by peritoneal irrigation is dependent primarily upon three factors: the amount of waste products stored in the extra-cellular fluids; the amount of edema present; and the rate of flow of the lavage fluid. According to Frank, et. al., (10) the ideal rate of flow is between 40 and 60 cc. per minute, at which speed 15 to 20

grams of urea could be removed in 24 hours. It was impossible for us to maintain this rate of flow because of technical difficulties, and consequently the urea output for a 24-hour period varied between 18.5 gm. and 0.39 gm. (Chart 2). The total daily lavage output varied between 375 cc. and 7075 cc. There seemed to be no constant relationship between the total urea output and the amount of perfusion fluid recovered. However, the length of stay of the lavage solution in the abdominal cavity did seem to affect the

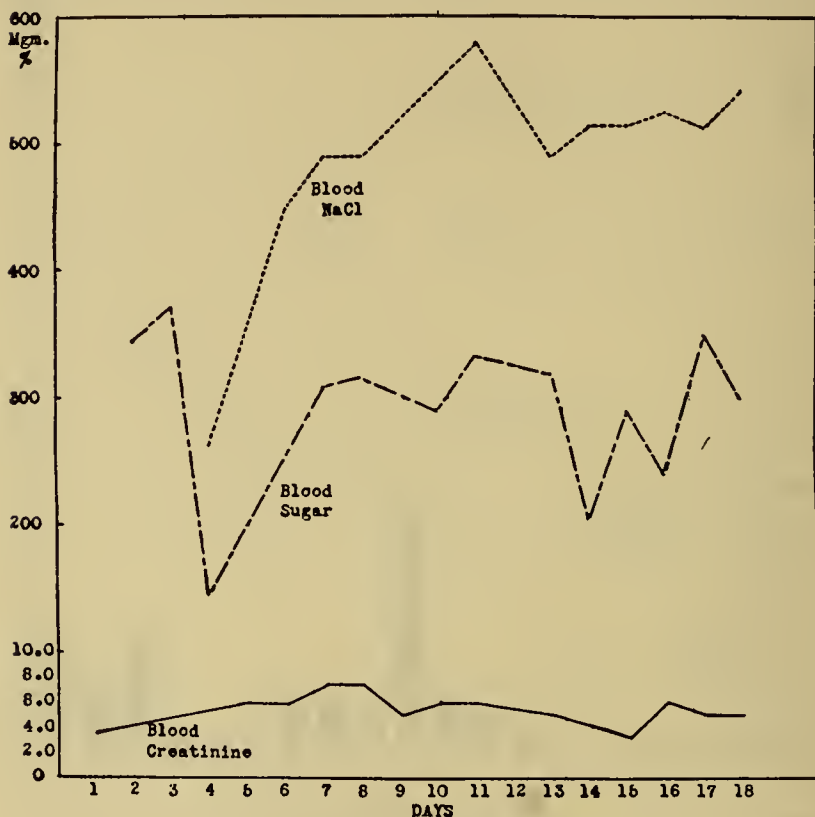


CHART 2. Further blood chemistry studies

urea concentration in direct proportion. Frank, et. al. (10) ran urea clearance tests on the lavage solution and found that with a rate of flow of 25 cc. per minute, 14.8 cc. of blood could be cleared per minute. This is of interest, as a renal clearance of 7.5 cc. per minute is adequate to maintain a normal blood urea, with the usual or slightly less than usual protein intake.

Although this patient did not survive, it is felt by the writers that the peritoneal lavage was very definitely of value in prolonging her life. It is

postulated that this patient suffered such extensive parenchymatous kidney damage that regeneration was impossible. It is evident that ample time for regeneration was insured, for this patient lived for 20 days after becoming totally anuric (totally anuric in the sense that not more than 35 cc. of urine was put out in any one 24-hour period). However, if this patient had had

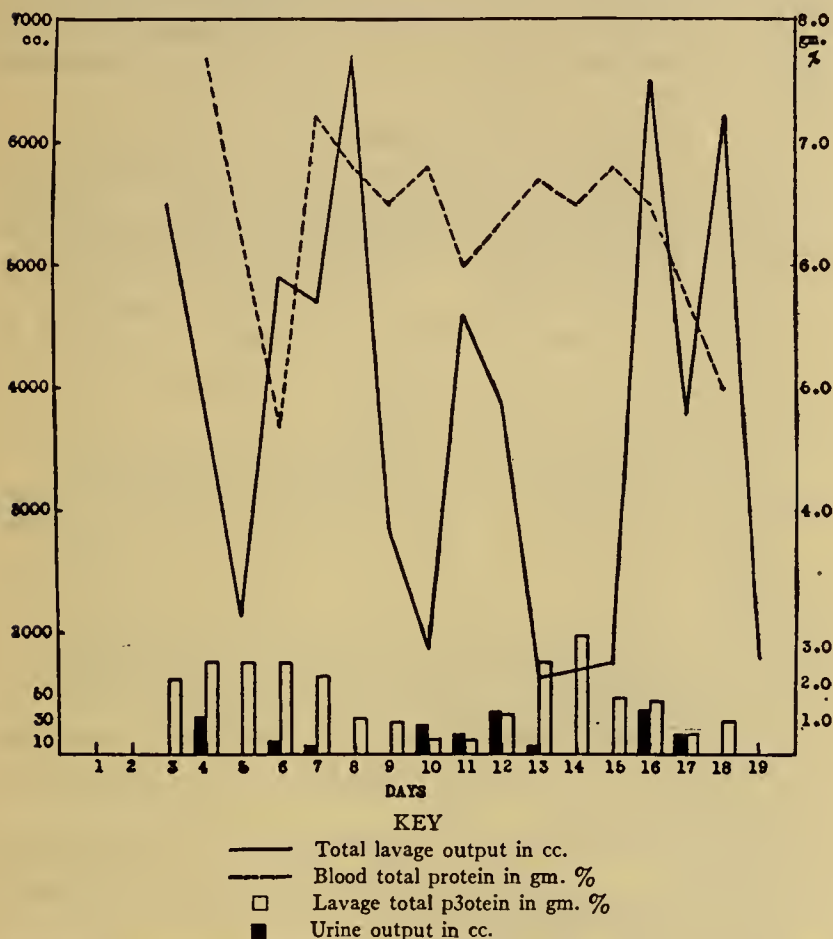


CHART 3. Relationship of urine output to lavage output and of blood total protein to lavage total protein.

some kidney reserve, peritoneal lavage might well have been a life-saving procedure. We feel that the establishment of this artificial dialysing system is indicated in those conditions of the kidney producing anuria which may be of a temporary nature. Such a list of causes of renal insufficiency has previously been presented. It is true that this procedure cannot be used over

long periods of time, but it does afford added control of the uremic state and prolongs the time in which return of kidney function may take place.

SUMMARY

A case of uremia with renal insufficiency, apparently caused by chemotherapy, is presented. Peritoneal lavage was instigated and the blood urea was kept at a level below that found in the usual progression of the uremic state. The patient survived for 18 days after lavage was started and for 20 days after becoming totally anuric.

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OBSERVATIONS ON THE BEHAVIOR OF MYOEPIThELIAL CELLS IN THE HUMAN BREAST*†

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Few subjects have been studied more than that of diseases of the breast. Despite this fact relatively few observations have been published in regard to the behavior of myoepithelial cells. As every cellular element is a potential source of pathologic change, this study was initiated in order to determine if these cells play a part in the origin of breast tumors, or if they are influenced by physiologic or pathologic changes within the breast.

The myoepithelial cells lie inside the basement membrane beneath the epithelium. They are elongated muscle-like cells situated parallel to the elastic membrane. In hematoxylin and eosin preparations the cytoplasm is pale pink, and, when highly magnified, fibrils paralleling the long axis of the cell become visible. The nuclei are deeply pigmented and oval to round in contour. The ratio of myoepithelial cells to epithelial cells varies from one to three to one to eight. Characteristically they are arranged spirally around the small ducts leading from the acini and occasionally surrounding the acini and the larger ducts.

The seemingly paradoxical term of "myoepithelium" is derived from the fact that these cells which are epithelial in origin have the appearance and function of muscle cells. They can be readily demonstrated in the apocrine glands of the skin, the glands of Moll, the lacrimal glands, the glands of the oral cavity, and the mammary glands of both the male and the female (1).

There is much speculation as to the function of these cells, but it is the current opinion that they have a propelling action to push forward the secretion of the glands into the larger ducts (Figs. 1 and 2).

Myoepithelial cells can be demonstrated by a variety of methods. The most satisfactory is the Verhoeff's elastic tissue stain to outline the basement membrane with the Masson tri-chrome stain superimposed. In this combination the elastic tissue is stained black, nuclei blue, connective tissue green, and the muscle fibres red. However, with experience in recognition, the routine hematoxylin and eosin stains were found satisfactory for their demonstration.

A study was made to determine the part played by myoepithelium in the physiologic and pathologic changes within the breast. Sections of mammary glands taken at autopsy and tissue removed at operation represented

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various intervals within the normal menstrual cycle of women in the reproductive period. No variation in myoepithelial cells was noted in response to the usual cyclic changes within the breast.

During the past ten years 505 cases of benign and malignant neoplasms of the breast and 261 cases of chronic cystic disease have been studied in the Department of Pathology of the University of Maryland School of Medicine.

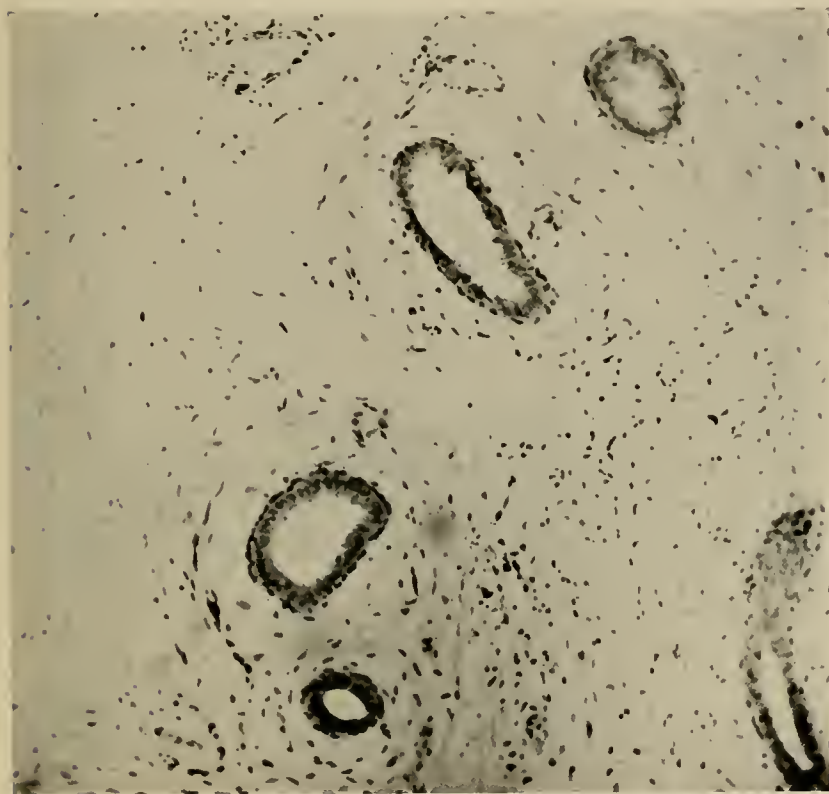


FIG 1. Photomicrograph of section of mammary gland from a 22 year old white female.
The deeply pigmented cells at the periphery of the ducts are myoepithelial cells.
Hematoxylin and eosin, X100

These cases were reviewed in an effort to determine the rôle of myoepithelial cells in breast lesions. In no instance were these cells found to be the site of origin of tumors and only rarely were there papillary formations or reduplications of the myoepithelial layer. These changes could be adequately explained in most instances by distortion or compression. The lesions reviewed are summarized in Table I.

Five sarcomas are included in the group. No case in this group was of muscle origin and a review of the literature reveals myomatous tumors of the breast to be exceedingly rare. Melnick (2) lists the possible source of

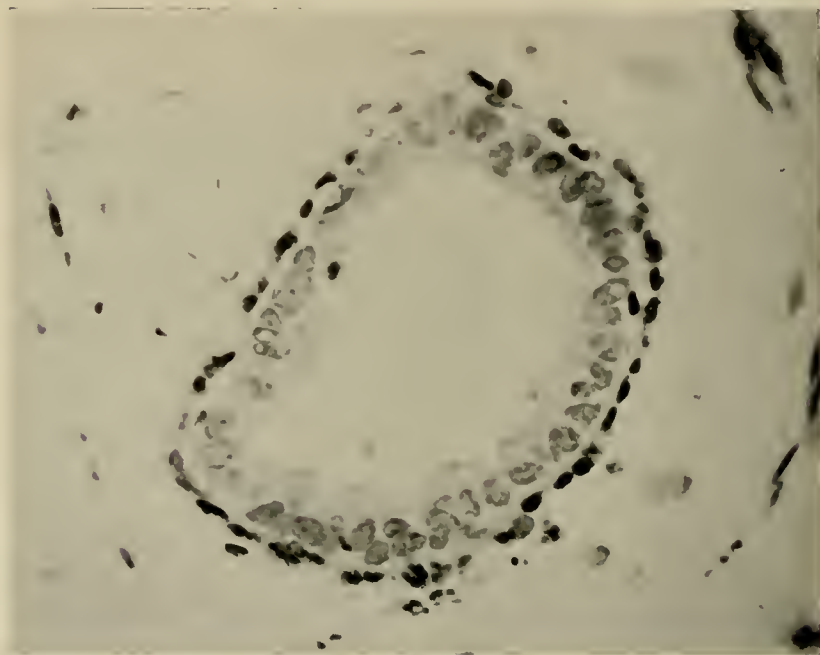


FIG. 2 Photomicrograph of section shown in FIG. 1 Hematoxylin and eosin, X430.

TABLE I

LESION	NO. OF CASES
CHRONIC CYSTIC DISEASE.....	261
FIBROSING ADENOMATOSIS }	210
ADENOFIBROMA }	
INTRADUCTAL PAPILLOMA }	19
INTRACYSTIC PAPILLOMA }	
CARCINOMA	271
SARCOMA	5

such tumors as from myoepithelium, smooth muscle of the nipple, teratoid origin, and the muscular layer of the blood vessels. He feels that the latter is the most probable source.

SUMMARY

Myoepithelial cells which are of epithelial origin occur in the human breast between the basement membrane and the epithelium. Their function is supposedly to propel the glandular secretion into the ductal system. These cells were found to take no part in physiologic or pathologic changes within the breast.

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CHRONIC VASOMOTOR RHINITIS IN PREGNANCY*†

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It is now generally agreed that pregnancy is associated with an altered state of physiology, but it is not always appreciated just how extensive this alteration is in the functioning of the various organs of the pregnant woman. Stander (1) states:

"It should be constantly borne in mind that pregnancy is not a mere local condition affecting the genitalia, but is a process associated with fundamental changes in the entire organism."

For many years it has been recognized that there existed a relationship between nasal physiology and the activity of the reproductive organs. In 1918 Siegmund (2) described more or less characteristic reddening and thickening of certain areas in the nasal mucosa of pregnant women. Other changes have been described in the larynx. The author now wishes to focus attention on the frequent occurrence of chronic vasomotor rhinitis in pregnancy.

ETIOLOGY

The exact etiology of vasomotor rhinitis is not known. In many individuals allergy plays a major rôle. In a much larger group, however, no specific allergen can be demonstrated as the offending agent. The cases which are secondary to pregnancy fall into this second group.

In these individuals there is a hyper-irritability of the autonomic nervous system, probably secondary to the increased blood concentration of hormonal products resulting from pregnancy. The result is a paresis of the smooth muscle of the turbinal cavernous tissues with resulting swelling of the turbinates. The greatest involvement is of the lower turbinates, with only minimal involvement of the middle and superior turbinates. The mucosa itself is often edematous and congested.

No detailed information is available to allow an accurate estimate of the incidence of chronic vasomotor rhinitis in pregnancy. However, it is safe to state that a number of pregnant women have some symptoms of nasal obstruction. In some, the symptoms are more annoying than in others, and in a small percentage of the cases the condition becomes a serious problem to both the obstetrician and the otolaryngologist. It is more often seen in the latter half of pregnancy and usually persists until sometime after delivery.

* From the Department of Otolaryngology of the Univ. of Md. School of Medicine.

† Presented before the Staff Meeting of the University Hospital September 19, 1946.

SYMPTOMATOLOGY AND DIAGNOSIS

The universal complaint is difficulty in breathing through the nose. This is always worse on lying down. Not infrequently the patients report that they are awakened a few hours after falling to sleep because of nasal obstruction and cannot fall asleep again. There may be an associated mucus discharge, both ante- and post-nasally, but this is not always present. There may also be some sneezing caused by contact between the septum and the lateral nasal wall. With persistence of the obstruction, secondary sinusitis frequently ensues and is usually persistent.

At first relief is obtained by the local use of vasoconstrictors. Each application of the sympatheticogenic drugs is followed by a period of sympathetic depression during which time the turbinates become even more turgid than before the drug was applied. This sets up a vicious cycle, since the patient then uses the nasal spray at more frequent intervals. After a time, the patient will require increasing concentrations of the same drug or a more potent vasoconstrictor. The relief thus obtained soon becomes more transient and application of a vasoconstrictor becomes more frequent.

Ultimately the patient finds herself with almost constant nasal obstruction, which is only poorly and transiently relieved by nose drops. She develops a state of "nervousness" from the constitutional effects of the absorbed sympatheticogenic vasoconstrictor drugs. The more "high strung" the individual is normally, the more serious will be the symptoms.

TREATMENT

The treatment of this condition has taxed the ingenuity of the otolaryngologist as well as of the obstetrician. Whereas all mechanical obstructions (such as septal spurs and deflections, hypertrophied turbinates, etc.) should be removed, it is not recommended that such surgical procedures be carried out during the latter half of pregnancy unless absolutely imperative. Rather, every effort should be made towards conservatism.

The use of all vasoconstrictors must be discontinued or markedly curtailed. Mild sedation with bromides or barbiturates, and the use of atropine in small repeated doses, is very helpful. The local application of heat in the form of compresses or by exposure to the infra-red lamp or to diathermy, affords much comfort, and is often helpful in combating the secondary sinusitis when present. It may be necessary to employ chemotherapeutic measures for the sinusitis.

Many efforts have been made to reduce the size of the lower turbinates by galvanocauterization or the application of caustics. These methods, while sometimes successful, are fraught with the danger of tissue necrosis and ultimate chronic dryness of the nose. In 1940 the author began a

study of the use of sclerosing agents in chronic vasomotor rhinitis, and in 1943 a series of over 200 cases treated by Sylnasol* injections with excellent results was reported (3). Previously Thacker (4) had published similar results with the same form of therapy.

Following submucosal injection of the sclerosing agents into the turbinates, there results a profuse fibrosis throughout the tunica propria, a diminution in the amount of mucus in the lumen of the glands without reduction in the actual number of glands, small round cell infiltration, and a reduction in the size and number of vascular sinuses (5). There has been no gross or microscopic evidence of atrophy of the tissues in any case even after observation for more than 5 years.

TECHNIQUE OF TREATMENT BY SCLEROSING INJECTIONS

Cotton pledgets saturated with 0.5 per cent Pontocaine solution are inserted between the lower turbinates and the septum, without prior application of a vasoconstrictor. After about 5 minutes, the pledgets are removed, and the Sylnasol is injected, using a 2 cc. tuberculin syringe and 23 gauge steel needle $1\frac{1}{2}$ inches long. The needle is inserted beneath the mucosa on the medial aspect of the lower turbinate anteriorly and gently pushed back into the turbinate, being careful not to make a counter-puncture. A full 0.5 cc. of the Sylnasol solution is injected as the needle is slowly withdrawn. The opposite lower turbinate is injected in a similar manner at once. The patient nearly always complains of some retrobulbar discomfort, but this is of short duration and seldom becomes intense. Occasionally slight pain is complained of in the teeth. If any of the solution drops into the pharynx as a result of accidental counter-puncture, the patient will complain of a burning sensation and may have some coughing for a few minutes. Thereafter, the only complaint is nasal obstruction, and this is only slightly relieved by nasal sprays, so that none are prescribed. In from three to five days the reaction begins to subside, and in about a week or ten days actual shrinkage of the injected turbinates can be observed. This process requires from five to eight weeks in all, during which time the associated symptoms of sneezing or nasal drip also usually diminish markedly.

The author does not employ Sylnasol injections into the middle turbinates as chronic enlargement of this structure is usually the result of actual bony hypertrophy, which is unaffected by sclerosing injections. Furthermore, injections into the middle turbinate are not without danger because of the intricate venous communications of this turbinate with the cavernous sinus.

* Sylnasol is the trade name of the G. D. Searle Co. for a solution of sodium psylliate.

RESULTS

To date the author has treated over 500 patients with chronic vasomotor rhinitis by sclerosing therapy. Of this number over 50 cases have been associated with, or secondary to, pregnancy.

In properly selected cases, i.e. where the condition has not persisted to the point where actual bony and soft tissue hypertrophy have supervened, the results of treatment by sclerosing injections has proved uniformly satisfactory. In every instance shrinkage of the turbinates resulted, and the patient was made more comfortable. There have been no complications to the injections and no sequelae.

CONCLUSIONS

1. Chronic vasomotor rhinitis is a complication of pregnancy and is probably secondary to the vasomotor instability generally present in pregnant women.

2. The condition is characterized by chronic nasal obstruction and is often complicated by sinusitis.

3. The persistent use of vasoconstrictors to alleviate the condition constitutes an abuse of the drugs in question, and may lead to aggravation of the symptoms rather than relief.

4. The condition can be satisfactorily treated by the submucosal injection of sclerosing agents into the lower turbinates.

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TOXIC REACTIONS TO LOCAL ANESTHETICS* †

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Local anesthetics are well known and extensively used in this period of modern surgery. The original local anesthetic "cocaine" came into use between 1860 and 1880. Because its toxic effects were established in 1892, research started in an effort to find chemical compounds to take its place. As a result of this research, a number of drugs have been developed, some of which are still in use. They vary in potency, duration of action, and toxicity. Cocaine is still ideal except for reactions occasionally resulting from its use. Procaine is used most extensively today where injection is the method of administration. It is inactive for topical application, so other drugs are needed. Because of its efficiency, pontocaine has become popular for this type of application.

The structural formulas of cocaine and the various synthetic compounds are very much alike. Reactions to the various compounds are similar, and their treatment is essentially the same. Probably the most practical classification of reactions for purposes of prompt interpretation and treatment at the scene is given by Woodbridge (1). Fundamentally the same description is given by Goodman and Gilman (2). Woodbridge describes two types of reaction: in the one there is depression of respiration and circulation, characterized by pallor, sweating, a fall in blood pressure and shallowness of breathing; the other type is expressed by "irritability of the central nervous system, culminating rapidly in convulsions", which may result in death. Many symptoms can be found describing motor reactions, and irritations and stimulations of the central nervous system. First, respiratory symptoms, probably of central nerve origin, are found less frequently. There is usually excitement, followed by somnolence and coma. Death is usually described as a result of respiratory failure, except in those cases which die within a few minutes following use of the anesthetic. Some consider that these very sudden deaths are the result of an allergy. The medullary, temperature regulating, respiratory, vomiting, vasomotor and vagus centers are stimulated; this is followed by a depression.

CASE REPORT

G. A. A white, married male, aged 72 years, was admitted to the University Hospital, August 12, 1946 with the complaint of difficulty in swallowing. This was of three months

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† Read before the Staff Meeting at University of Maryland Hospital Sept. 19, 1946.

duration. At the time of his admission, the patient could consume no solid foods, and liquids were taken with difficulty. As a result he had lost 35 pounds of weight. On August 13th, he was prepared in the usual way with 2 per cent pontocaine and esophagoscopy. A papillomatous, vascular mass was found in the middle third of the esophagus. It appeared to be malignant. A biopsy and pathologic examination revealed it to be a squamous cell carcinoma of the esophagus, grade II. Roentgenographs taken August 14 and 17 showed an incomplete obstruction, 8 cm. long, of the middle third of the esophagus, with impression of (1) carcinoma of esophagus, (2) arteriosclerosis, (3) emphysema, (4) scoliosis and arthritis of the thoracic spine.

Surgery was considered and bronchoscopy was requested among the various other preoperative studies. The patient returned to the clinic on August 20 and was again prepared with pontocaine in the routine manner. Following the third spraying of the pharynx and larynx, he was taken directly to the operating room, where he moved easily from the stretcher to the table. Promptly upon lying down on the table, he became pale, with irregular, shallow respiration. The patient appeared cyanotic, and his rapid, weak pulse was counted at 120 per minute. Shortly following this, clonic muscular twitching started about the face and neck and involved the arms and legs. Oxygen was administered by mask, and 3 grains of sodium phenobarbital was given intravenously. The convulsive seizure soon ceased, and he became relaxed and asleep. During the attack the patient went into coma which he came out of as the sedative took effect. He was returned to his bed in fair condition. However, his respirations remained shallow; his pulse was weak and irregular throughout the afternoon. The reaction had occurred about 2 P.M., and at 7 P.M. there was a light chill, followed by an elevation of temperature to 102, which returned to normal in about 24 hours. On August 27 the patient was again bronchoscoped. This time one quarter grain of morphine sulphate was administered one-half hour before bronchoscopy, and the larynx was swabbed with 4 per cent cocaine. No reaction occurred, and the bronchoscopy was successful.

During the patient's subsequent stay in the hospital a gastrostomy was performed. He developed an apparent atelectasis, fever and urticaria, and had two reactions, apparently caused by the medicine he was given. He was discharged on September 15, 1946.

The usual hospital preparation of a patient for endoscopy is to give some sedation about one hour before the operation. In the clinic the fauces, oropharynx and hypopharynx are sprayed with 2 per cent pontocaine at about 5 minute intervals. For esophagoscopy patients are instructed to swallow one spraying, and expectorate the surplus of the other two. If being prepared for bronchoscopy, they are instructed to breathe during the spraying, and expectorate the surplus. The quantity used is unknown, but it is estimated to be 2 or 3 cc. The patient mentioned in this case report had the usual preparation for the first two endoscopic examinations with a variation in the preoperative sedation. One hour before the first examination, he had 3 grains of nembutal, and an hour before the second $1\frac{1}{2}$ grains of nembutal and on call $\frac{1}{2}$ grain of morphine sulphate. One hour before the third bronchoscopy, he had $\frac{1}{4}$ grain of morphine sulphate; and 4 per cent cocaine was applied locally to the pharynx and larynx just preceding the operation.

FREQUENCY OF REACTION

An investigation of the subject would lead one to the conclusion that reactions are rather frequent. This is true when all types are considered. Severe reactions are comparatively rare, considering the millions of local anesthetics in their various forms that are being given. The reaction may vary from a mild conjunctivitis to sudden death, following the use of only a

few drops of a dilute solution in the conjunctival sac. Likewise in the various branches of medicine and surgery, many types of reaction are encountered.

In 1924, under Meyer (3) a survey by the Council of Pharmacy and Chemistry of the American Medical Association collected 43 unreported deaths up to that time, 22 of them resulting from the use of cocaine. The literature contains the reports of many more deaths and severe reactions since that date. In the University of Maryland Hospital, another moderately severe reaction to pontocaine occurred in the bronchoscopic clinic about two years ago. Another occurred in the Department of Roentgenology about one month ago. Within the past two months, the author has seen two other mild reactions to small quantities of cocaine applied topically.

CAUSES OF REACTIONS

The chief cause of these reactions is the too rapid absorption of too much of the anesthetic either from a highly vascular area, following intravenous injection, or from a surface where the mucous membrane is broken. Bladder ulcers, open wounds, or trauma incurred by the application present such sites for this rapid absorption.

Other factors to be considered are the potency of the anesthetic, and the substitution of one drug for another, such as cocaine for procaine. Many authors attribute such reactions to anaphylaxis or to allergy. On the other hand Cullen (4) states that 99 percent are not anaphylactic or allergic in nature. Other good authorities are of a like opinion. Some fatal cases reported in the literature were the result of the administration of large amounts, as much as 13 cc. of 2 per cent pontocaine. In some cases this drug was either injected or allowed to trickle down in the trachea.

TREATMENT OF REACTIONS

Treatment may best be considered under two headings, prophylactic, and actual treatment of a reaction.

Prophylactic

First and foremost, the physician who uses local anesthetics should have a clear knowledge of them, their proper place and method of use, the reactions that may occur and the treatment. Second, the patient should be properly studied and his condition considered. Patients with allergies need extra caution and should be skin tested before the anesthetic is employed. Likewise patients with bronchial asthma, emaciation, cardiac and thyroid complications, endocrine disorders and denuded areas require especial consideration and precautions. Third, premedication is advised by most

writers in the recent literature. Tatum, Atkinson and Collins (5) first called attention to the fact that hypnotics are the best drugs in the prevention and treatment of reactions. They found the barbiturates to be most effective. Sodium amytal, sodium phenobarbital and nembutal in fairly large doses are recommended. Fourth, where local anesthetics are being used, there should be on hand at all times, ready for instant use, the necessary medicines and equipment to treat reactions. They are mentioned under "Treatment." Fifth, the anesthetic should be used in the weakest dilution possible to obtain the desired results. Toxicity increases in geometric ratio with increased concentration of the drug. That is, a 1 per cent solution is about four times not just two times as toxic as 0.5 per cent solution. Sixth, addition of adrenalin potentiates the action of the local anesthetic and should be used where possible in from 1-100,000 to 1-200,000 strength. In addition, this drug slows down the rate of absorption, making the use of smaller concentrations possible with prolonged action.

Treatment

First, the treatment should be clearly in mind before a reaction occurs. Considering Woodbridge's classification of types of reaction, the treatment, in brief, is as follows:

Cases with respiratory and circulatory failure: (1) The patient is placed in shock position, (2) oxygen inhalation is begun, (3) epinephrin (or metrazol or caffeine sodium benzoate) is administered intramuscularly, (4) fluids are given intravenously.

Cases with irritability of the central nervous system: (1) a barbiturate is administered intravenously immediately to control the convulsion. For this, the sodium salt of pentothal, amytal or phenobarbital may be used, the first mentioned being most rapid in action. (2) Oxygen inhalation is given; through an endotracheal catheter if necessary.

When normal respiration fails, the administration of artificial respiration is important. When the circulation fails, intracardiac injection, using a three inch needle, is imperative.

Two additional secondary reactions must be considered. They are: (1) barbiturate over-dosage for which picrotoxin is used. It must be kept on the emergency shelf, (2) A reaction to an overdose of adrenalin which passes off in about 15 minutes. This requires no treatment.

CONCLUSIONS

(1) Local anesthetics are extensively used in the practice of medicine, surgery and dentistry.

(2) Reactions are various in types and severity. They vary from a mild reaction to sudden death, and are relatively frequent.

(3) Every user of these valuable but dangerous drugs should have a clear knowledge of their indications and contra-indications, reactions and treatment.

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DEPARTMENT OF OBSTETRICS

CASE REPORT

A. H., a 25 years old para 0-0-3-0 was first seen on April 8, 1946. Her past and family histories were non-contributory. She had had three previous spontaneous abortions; the first occurred in 1942 at 12 weeks, the second in 1943 at 16 weeks, and the third in 1944 at 20 weeks. There was no apparent cause for these abortions. LMP-December 1945. EDC-September 1946. A physical examination was negative. Her pelvic measurements were: Sp. 22; Cr. 25; Tr. 32; Baud 20; C.D. 12; T.I. $9\frac{1}{2}$; P.S. 9. The patient weighed $146\frac{1}{2}$ pounds. Her blood pressure was 114 systolic over 62 diastolic, and the prenatal course was uneventful. She was given stilbestrol and corpus luteum treatment throughout pregnancy. Her blood pressure remained within normal limits. There was no excessive gain in weight, the maximum reaching 164 pounds on October 7, 1946. Because the presenting part had not entered the pelvis, roentgen pelvimetry was done on October 1, 1946, at which time her antero-posterior diameter of the inlet was reported to be 11 cm. and the transverse 11.8 cm. All other measurements of the pelvis according to the Caldwell-Malloy classification revealed a normal gynecoid pelvis. From the roentgenologic point of view there did not seem to be any cephalopelvic disproportion. A vaginal delivery was expected.

The patient entered the hospital on October 12, 1946 at 5:50 A.M., with pains having begun at about 2:30 A.M. and occurring every half hour with a slight bloody show. A rectal examination revealed the cervix to be finger-tip dilated and the presenting part floating. The patient's temperature, pulse, and respirations were all normal. Her pains, however, remained rather irregular, occurring every ten to fifteen minutes and lasting only ten to fifteen seconds. On October 13, 1946 at 6 A.M. contractions were still somewhat irregular, but at this time the cervix was thought to be 3 cms. dilated with the presenting part 3 cms. above the spines. All through the day the patient's pains were not too frequent but picked up so that they were occurring every 5 minutes. However, there was no apparent progress as evidenced by dilation of the cervix and descent of the head. The patient during that day received intravenous glucose and fluids by mouth, and tuinal for sedation. She had now been in labor for nearly 50 hours. What is the subsequent treatment in this case?

COMMENT

This case illustrates quite well that it is impossible to make an exact science of obstetrics. The patient had been in labor for nearly 50 hours and had made only minor progress, the cervix being only 3 cms. dilated and the presenting part quite high. The roentgenologic measurements of the pelvis appeared normal, and experience has taught that their accuracy can be depended upon within a fraction of a centimeter. The roentgenologists, on the basis of their findings, felt that she should easily deliver from below. However, they did not (or probably could not) take into consideration two important factors: the presentation (R.O.P.) and the character of the pains. Incidentally a partial uterine inertia is frequently seen in conjunction with disproportion.

It would appear that there were two courses open: first an attempt might be made to stimulate the uterus to increased activity by the administration of minimal ($\frac{1}{2}$ minim) doses of pituitary extract and hope that in this manner the head would descend and the cervix dilate. The dangers of this method are rupture of the uterus, deep cervical lacerations and injury to the baby. In the event of failure, valuable time has been lost. Furthermore, the mother has been subjected to the increased risk of infection and the welfare of the baby has been jeopardized.

The other method of treatment was to abandon delivery from below and resort to a caesarean section. It is true that the length of labor made this procedure somewhat more hazardous than if it had been done prior to the onset of labor. Still, with modern chemotherapy and the low caesarean section, results are usually good.

In view of the aspects as presented, it would appear that the latter was the more conservative method. One might state that if the patient had been properly evaluated earlier, the operation could have been done more promptly, and the results might have been better.

ACTUAL TREATMENT

A laparotrachelotomy was done with the result that a full term, living child, weighing 7 pounds, $7\frac{1}{2}$ ounces was delivered. The operation was uneventful, and the mother and baby left the operating room in good condition. The patient was given penicillin prophylactically. For the first 24 hours, she had a fever of 101.2. After this, the temperature returned to normal and did not rise again. She and the baby were discharged in good condition on October 28, 1946, her fourteenth day post partum.

THE ONE HUNDREDTH ANNIVERSARY OF THE FIRST ADMINISTRATION OF ANESTHETIC ETHER

At half past three on Wednesday, October 16th, 1946 in the Bressler Library, the Staff of the Department of Pharmacology, University of Maryland, School of Medicine, held ceremonies in celebration of the one hundredth anniversary of the first administration of anesthetic ether. Dr. John C. Krantz Jr. presided. An invocation was offered by the Rev. Dr. Walter Thomas Jackson, Pastor, Faith Presbyterian Church. Mr. C. P. McCormick gave a brief address of welcome. This was followed by a series of papers entitled *Anesthesia: "A Tide in the Affairs of Man"*. The first of these, *Surgery Before Anesthesia*, was by Dr. Henry E. Sigerist, Professor of the History of Medicine, Johns Hopkins University. This was followed by a paper on *Dr. W. T. G. Morton and Ether*, by Dr. J. Ben Robinson, Dean of the School of Dentistry at the University of Maryland. In the absence of Dr. Robinson it was read by Dr. Gardner Foley. The series was concluded by *Anesthesia Today and Tomorrow*, by Dr. Henry S. Ruth, the Editor of *Anesthesiology*.

A painting, entitled *The First Administration of Anesthetic Ether*, by Stanley M. Bell after a daguerreotype, was presented, with a few remarks by the donor, Dr. H. A. B. Dunning, of Hynson, Westcott and Dunning. The presentation was followed by a song *The Patient Sleeps*, sung by Rev. John Hedeman and composed for the occasion by Theodore Chanler, with words by William E. Henley. The program was concluded by a benediction by Dr. Jackson.



SURGERY BEFORE ANESTHESIA

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It is a privilege and an honor to have been invited to participate in a program commemorating the centenary of anesthesia under the auspices of a Department that has made history in the field. Indeed, the year 1846 marks a turning point not only in the history of surgery but in many respects in the history of medicine at large. We all know what became of surgery after 1846, how one organ after another, one system after another became accessible to the knife. The abdominal organs were now attacked by the surgeon, appendix, gall bladder, stomach, and other parts of the intestinal tract. In the course of time other organs that surgeons had never dared to touch, the kidneys, the thyroid, the lungs, brain, and even the heart became objects of surgical intervention. The new surgery created a new atmosphere in the hospital which, from a place of despair, became one of hope. The accent was shifted from death to life, and if patients at last lost the fear of being operated on, it was primarily because of the introduction of general anesthesia.

There obviously was surgery before 1846 but it is hard for us to realize what this early surgery was like. The best we can do in order to find out what the field and scope of surgery was before 1846 is to take a textbook published before that date. Going through our Library, I picked at random a book that was very popular in England as well as in America, *The Principles and Practices of Modern Surgery* by Robert Druitt, the American edition of which was issued at Philadelphia in 1844. The book has 568 pages of which, characteristically enough, only 7 are devoted to abdominal diseases and injuries and their treatment and only $4\frac{1}{2}$ pages deal with the chest. What then were the primary objects of surgery in those days? They included wounds including burns, fractures and dislocations, hernia, bladder stones, also the whole field of ophthalmology, whether operative or not, and the treatment of venereal diseases. Some of the general recommendations given in this book are significant. Thus we read on page 518:

"The Apparatus necessary for operations in general comprises one or more bistouries, scalpels, or other specific cutting instruments;—a dissecting forceps, a tenaculum, and small forceps (which should have a spring or catch) to take up arteries;—plenty of well-waxed ligatures, curved needles threaded, fine sponge, water both warm and cold, and wine and hartshorn in case of faintness. There should also be a sufficient number of assistants to restrain the patient's struggles, to administer cordials, to hand the different instruments to the surgeon, or to assist him in other respects,—besides a good light, and a

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bed or table with pillows or cushions to make the patient's position as easy as possible . . . Moreover, the operator should always cut the skin as speedily as possible, for it is a most painful part of every operation. He should also take care to make the incision quite as long as will be required—and rather too long than too short. To pause in the middle of an operation, and cut a little more of the skin, is most awkward on the surgeon's part, and most cruel to the sufferer."

Before the introduction of general anesthesia, the surgeon was forced to perform an operation as speedily as possible. Larrey, Napoleon's great surgeon, cut off arms in the shoulder joint in less than a minute and his counterpart in the Hannover army, K. J. M. Langenbeck, was supposed to have said that the exarticulation of an arm did not take more time than it would take an onlooker to pinch up and inhale a little snuff.

We can see from Druitt's book that in 1844 the scope of surgery was still very limited, and when we look back to the 16th century and consult the works of a great Renaissance surgeon, the Frenchman Ambroise Paré, who is often considered the father of modern surgery, we are astonished to find that he performed very much the same operations as Druitt did. And this is even true when we go still further back to late antiquity. The surgery described in the book of Paul of Aegina in the 7th century A.D. is not so very different from that of Paré or even Druitt. I do not mean, however, that no progress was ever achieved from antiquity to the 19th century. The type of injuries changed in the course of time. War wounds changed with changing weapons, and we all know that the introduction of firearms in the 14th century had a deep effect on war surgery. Operative techniques were undoubtedly improved in the course of time, and in the early 19th century there were courageous surgeons like your honorary graduate, Ephraim McDowell, who without anesthesia dared to remove large tumors from the abdominal cavity. The scope of surgery, however, remained very limited up to the middle of the 19th century.

What was the cause of this limitation? Was it the lack of anesthesia, the fact that operations could not exceed a certain amount of time and could not be performed on the relaxed body? To a certain extent, yes, but not exclusively. We must also remember that the introduction of ether anesthesia was not the first attempt to render the patient insensible. From antiquity on, surgeons and physicians endeavored to mitigate pain and to make painless operations possible. Probably the most effective ancient narcotic was a decoction of mandrake, the roots of which contain scopolamine as we know it today. Other drugs, such as opium and later also alcohol, were used for a similar purpose. Local anesthesia was produced by applying snow or ice to the skin, and in the early 19th century patients were sometimes even operated on successfully in hypnosis. And yet, all these methods were never generally used. Many were unreliable and some were dangerous or their effect was too short.

Why then did surgery not have its great development before the middle of the 19th century! Or we may put the question differently: Why was general anesthesia not developed before the middle of the 19th century? In other words, what was the background of Morton's contribution?

We find the answer to these questions when we study the development of the concept of disease. Surgery is one method of treatment and, like other such methods, it is largely determined by the concept of disease prevailing at a given time. For over 2,000 years disease was considered the result of the disturbed balance of the cardinal humors of the body which enjoyed health when the humors were perfectly balanced but showed symptoms of disease when this balance had been upset by a wrong mode of living, a wrong diet or some other abnormal condition. Where such a view prevailed, the logical treatment consisted in correcting the mode of living, in prescribing a corrective diet which might be enforced with drugs. Dietetics and pharmacology provided the treatments of choice, and surgery was a last resort when all other means had failed.

From the Renaissance on, we find a new approach to the problems of health and disease gradually developing. In 1543, Vesalius published his *De corporis humani fabrica libri septem*, Seven Books on the Structure of the Human Body, a book that was to become the starting point of a new medical science. In the 17th century, anatomy became *anatomia animata*, animated anatomy, and an anatomic physiology was born when William Harvey published his discovery of the circulation of the blood in 1628. Heretofore physiology operated with philosophic concepts such as that of the innate heat which was felt and not measured, of the humors some of which were assumed, of qualities and spirits, names for vague forces. The best physiologic theory before Harvey was the one that explained every phenomenon logically and without any gaps. With Harvey physiology became anatomic. The structure of an organ was studied in order to understand its function. No explanation was accepted as correct if it was impossible anatomically. Harvey used concepts of science, particularly of mechanics, and asked the organism questions. His method was the experimental method. Thus a new physiology was born which was based on anatomy and used the experiment as a method of research, and which described phenomena not only qualitatively but also quantitatively.

In the 18th century a new field of medicine was conquered by the anatomic method. Pathology, the science of disease, became anatomic. In 1761 Morgagni published the results of a long life's researches in *De Sedibus et Causis Morborum per Anatomen Indagatis Libri Quinque*, Five Books on Seats and Causes of Diseases Investigated Anatomically. Morgagni, on performing a large number of autopsies, found that organic lesions were responsible for certain diseases. It seemed obvious that if an organ was abnormal, its function would be abnormal also. What the physician called

symptoms of disease appeared as the abnormal functions of injured organs. Morgagni established the method of investigation that pathology has used with so much success, the recording of all symptoms observed clinically during the course of a patient's illness and the comparison with the anatomic findings of the autopsy room. It was by following this method that pathology during the last century and a half was able to differentiate most of the cardio-vascular, gastro-intestinal, respiratory and many other diseases that are known to us today.

As soon as physicians held the view that many diseases were characterized by their seat and that the symptoms were the result of anatomic lesions, it became the purpose of diagnostics to perceive anatomic changes on the living patient. To that end the methods of percussion and auscultation were developed, instruments such as the ophthalmoscope were devised that permitted one to observe the anatomy of the interior of an organ. With bulbs and mirrors, the physician endeavored to look into all the cavities of the human body, and roentgenology was the triumph in this line of development.

From the Renaissance on, one field of medicine after another had been conquered by the anatomic method, and in the early 19th century there was only one that still had not felt the influence of this new approach, namely therapy. The treatment of disease followed traditional lines and still consisted chiefly of the prescription of diets and the application of drugs which were given because experience had taught that they were effective.

When physicians began to think in terms of anatomy, their attitude toward surgery changed, and surgery gradually assumed a primary position among therapeutic measures. If disease was the result of anatomic changes, surgery could correct them directly. The surgeon, by removing an abscess, an ulcer or a tumor, was removing the disease and thus correcting the organ. Thus, toward the middle of the 19th century, the approach to the problems of disease and its treatment had changed in such a way that surgery now appeared as a primary form of treatment. Surgery, however, could not develop freely before the two bonds had been removed that enslaved the surgeon and wrecked the success of so many operations, pain and infection. In order to overcome these bonds, experiments were made with gases that promised to induce general anesthesia, nitrous oxide, ether, chloroform. General anesthesia liberated the surgeon from one bond, and the other was broken when Lister introduced the method of antiseptics which was gradually developed into asepsis. Surgery now was free to develop along the line that Western medicine had taken ever since the Renaissance.

Today, on October 16, 1946 in reverence and with gratitude we remember the men who, a hundred years ago, met in Boston and had the imagination and courage to perform the crucial test and the wisdom to recognize its full significance for the future.

DR. WILLIAM T. G. MORTON AND ETHER*

J. BEN ROBINSON

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Prior facts and antecedent discoveries are basically essential to the success of the productive investigator. A review of the contributions of great discoverers indicates that success in enterprise is achieved largely by exploiting the experiences of students and observers who have contributed new knowledge, and by extending and applying specific experimental gains that have been made by other workers in the same area of investigation. It is not too much to say that all scientific discovery of lasting value to society has stemmed from preliminary investigation and experiment of a useful contributory character.

The discovery of anesthesia followed such a pattern. The long road which led finally to the conquest over pain began with man's first clear conception of the meanings of pain and death. These two enemies of man have been inseparable terrors of the human race, and throughout history man has sought diligently, feverishly, frantically to control the one and postpone the other. These primitive efforts, plus the related work of the pure scientist, laid the groundwork for ultimate success in achieving complete control over physical pain.

Among many early civilizations crude means were used for reducing the degree of physical pain to which the patient was exposed when subjected to operative surgery. The literatures of many early civilizations include references to the use of sleep-producing potions, while early medical writings refer to various drugs which were employed by the physician to reduce or prevent physical suffering. But the use of none of these agents persisted to any degree beyond the opening of the 19th century.

The true foundation for the discovery of anesthesia was laid in experimental chemistry. The tremendous activity and advancement in chemistry in the latter part of the 18th and the early part of the 19th centuries opened up inviting avenues of scientific advancement in many directions, including the applications of new discoveries to the medical services. In 1799 Sir Humphry Davy demonstrated the stupefying properties of nitrous oxide and suggested the possibility of its successful application as an aid to surgery; and in 1818 Michael Faraday discovered the anesthetic properties of chemical ether. In view of the positive knowledge concerning the anesthetic properties of those agents contributed by both Davy and Faraday it seems strange that some resourceful surgeon did not experiment with them as

* From the School of Dentistry, University of Maryland.

useful aids in surgery. The demonstration of their values to mankind remained to chance and to casual observation.

Both nitrous oxide gas and chemical ether possess the property of producing excitement and exhilaration in those subjected to their use. For many years they were used extensively for their intoxicating effects. Ether parties and nitrous oxide entertainments were among the most popular social events of the times. Out of this aspect of the use of these beneficent agents came much of value to the final discovery of anesthesia.

In December 1844 Dr. Horace Wells attended an exhibition at which the stimulating effects of nitrous oxide gas were demonstrated. It is a familiar story: During the performance, one of the participants injured himself in a manner that normally would have caused him much pain; but when questioned he declared he felt no ill effects whatever. Wells observed this phenomenon and at once concluded that in addition to its exhilarating effects, nitrous oxide possessed also a property that would deaden pain caused by trauma. Realizing the vast possibilities of this agent if his deduction were correct, Wells decided to experiment with it in the hope and expectation that it could be used to control pain in operative oral surgery. Therefore, he arranged at once for an experiment, with himself as the subject, in which he took nitrous oxide gas for the purpose of having one of his teeth extracted. The tooth was removed without the slightest pain to the patient. The experiment was successful and the results of this epoch-making incident were immediately announced to the public.

Following the experiment on himself Wells employed the gas extensively in his private practice in order to test its reliability and to determine the extent of its usefulness. These subsequent experiences with the new and magical agent were highly successful and convinced the discoverer of its unlimited possibilities in the field of surgery. With these experiences back of him and with his faith in the future value to mankind of his discovery established, Wells soon went to Boston in order to make his technique known to the medical profession in that city. This visit held both great and ominous possibilities for the discoverer. Upon his arrival in Boston he called on a former friend, the distinguished chemist, Dr. Charles Thomas Jackson, and conferred with a former associate, Dr. William T. G. Morton. He conferred also with Drs. J. C. Warren and C. F. Hayward, to whom he explained his discovery. As a result of these conferences Dr. Warren invited Wells to lecture before his medical class at Harvard and later arranged for him to demonstrate his method of controlling pain, a demonstration which, it will be recalled, was only partially successful. Despite his failure to achieve complete success, to Horace Wells belongs the honor for the discovery of surgical anesthesia. It is not contended that he discovered the anesthetic properties of nitrous oxide gas. However, it is

contended that he observed the state of insensibility to physical pain which resulted from its inhalation; that he recognized that the physical state produced by the inhalation of the gas differed from the ordinary condition of intoxication; and that he was the first to demonstrate that complete anesthesia of adequate duration for surgical operations could be secured.

While Wells' demonstration of anesthesia before the class at the Harvard Medical School was not a success in the full sense of the word, his conferences with friends in Boston and his lectures and demonstrations at Harvard were conducted in a sphere of interest and activity out of which finally came, under the most auspicious circumstances and with complete success, the use of ether as an aid to surgery.

To William T. G. Morton belong the honor and the credit for introducing sulphuric ether as an effective anesthetizing agent in cases requiring operative surgery. Fate seems to have assigned him to a set of circumstances in which he was exposed to all the factors relating to the current status of anesthesia, and nature had provided him with those essential qualities of mind and heart that led him inevitably to exploit these factors in the interest of humanity.

Morton lived and practiced dentistry in Boston in close association with some of the leading medical authorities of the day. He knew many of them personally and commanded their highest respect. In addition his professional education was gained in close relationship with those who had gone far toward perfecting the practical use of surgical anesthesia.

Morton began the study of dentistry under the tutelage of Dr. Horace Wells and, for a short period of time, was associated with him in a partnership dental practice in Boston. Later Morton visited Wells a number of times at Hartford, notably in July 1845, when he conferred with him concerning the methods of manufacture and the technique of administration of nitrous oxide gas. He studied medicine in the office of Dr. Charles Thomas Jackson, a chemist of unusual ability, who had experimented with the exhilarating and anesthetic properties of sulphuric ether, as Faraday had done thirty years earlier. Morton matriculated at the Harvard Medical School in 1844 and attended a few lectures. Incidentally, it has been said by an enthusiastic biographer that Morton graduated at the Baltimore College of Dental Surgery. This claim for him is in error.*

In his introduction of ether as an aid in operative surgery, Morton conformed to the pattern followed by others in the advancement of scientific

* "We will not controvert the statement that 'during the next eighteen months he diligently pursued the study of his profession', but we deny that the few weeks spent in Baltimore were devoted to the systematic study of his profession. He was never so much as a matriculant of the College of Dental Surgery, far less did he graduate." Editorial by Chapin A. Harris, *American Journal of Dental Science*, New Series V. 9, No. 2, April 1859, pp. 292-293.

discovery. He drew upon the fact that surgical anesthesia was a reality, upon the successful experiments of others with nitrous oxide gas, and upon the scientific findings of the chemist that the physiologic effects of ether resemble closely those of nitrous oxide. With these resources at his disposal he called upon his own courage, foresight and genius to fashion a method destined to give to humanity sure relief from the horror and pain of operative surgery. The facts that Morton depended on prior knowledge and earlier successful experiments to reach his objective do not take any credit from the great discoverer who deliberately, purposefully and courageously translated the findings of others into a highly useful and beneficent instrument of mercy and service.

It is a notable fact that Morton approached his task by way of the experimental method. Whereas Wells subjected himself directly to experiment in order to test his assumption, Morton began by experimenting on animals in order to determine the action of the particular agent on the living organism. Having by this method proved both the efficacy and safety of sulphuric ether in producing anesthesia he applied it to use in operative surgery. On September 30, 1846, he administered ether to a patient for the purpose of extracting a difficult tooth. Subsequently, he made other tests; and finally, on October 16, 1846, Dr. Morton administered ether vapor to a patient in the Massachusetts General Hospital in preparation for a surgical operation. The patient manifested no signs of pain, and on October 17 the experiment was repeated with equally favorable results. As a consequence of these successful tests Dr. Morton was proclaimed by the medical profession and the people of Boston as the discoverer of anesthesia.

When Morton's experiment with ether proved successful he claimed the discovery of a new agent that would produce anesthesia; he tried to hide its identity from everyone, including Dr. J. C. Warren, the surgeon, and he proceeded promptly to patent the agent under the trade name, *Letheon*. However, when the true nature of the agent became known, Morton conceded that he had received assistance in his experiments with ether vapor from Dr. Jackson and freely agreed to share with him the honor and emoluments accruing from the discovery. From this point he went on striving desperately to secure financial returns from his discovery.

The subsequent experiences of Morton in his regrettable attempt to commercialize his services to mankind were most embarrassing to his friends and the professions. In the beginning of the famous ether controversy the contention was purely with respect to the discovery of ether as an anesthetizing agent. Both Morton and Jackson were aware of Wells' successful experience in using nitrous oxide gas to produce anesthesia; but strangely enough, both contended that it could not achieve the results claimed for it.

On these grounds they claimed to be the discoverers not only of ether anesthesia but of the principle of surgical anesthesia.

There can be no doubt of Morton's right to the claim that he was the first to administer ether for the definite purpose of producing complete insensibility to physical pain and that the popularization of surgical anesthesia and its world-wide acceptance by science and medicine stemmed from his successful demonstration of it at the Massachusetts General Hospital. And there can be no question of the fact that from his determined, courageous efforts to convince the world of the safety and efficacy of an agent that he had tested and found effective in producing complete insensibility to pain, came directly one of the greatest blessings that have ever been conferred on the human race. Any subsequent errors of judgment on his part with respect to material rewards and benefits should be forgotten or looked upon with pity in the light of the positive values of the rich contribution he made to humanity.

ANESTHESIOLOGY TODAY AND TOMORROW*

HENRY S. RUTH, M.D.†

PHILADELPHIA, PA.

Anesthesiology is a century old today, if its birthday is estimated to have been on the day of its first public demonstration. At 100 years of age it is yet but a husky, well developed adolescent specialty, even if "it has established its unequivocal value to the surgical and medical professions, and to those seeking medical care coming under its jurisdiction." (1) Its growth and development, therefore, must have been inhibited somewhere, somehow. These inhibiting factors are usually not clarified nor made evident by a recital of ordinary historical facts alone, interesting though they may appear. A delineation of them in detail at this time might be both appropriate as well as of historical interest, but, I fear, they would be excessively time-consuming. A few significant factors, perhaps, may be sketchily outlined. After the original discovery of satisfactory pain relief had been established, the administration of anesthesia by inhalation and injection of drugs was placed in the hands of almost any available person. Young, unestablished surgeons, internists, general practitioners, interns, nurses, and even lay persons accepted the responsibility of, or were assigned by necessity to, their management. Success and safety in varying degrees resulted. The development of anesthesiology, later, was stimulated by the demands of surgery. When operative procedures of moderate magnitude and duration only were practiced, as formerly, disastrous and deleterious results were rare and of less consequence and even many times ascribed to factors other than poor anesthetic management. The severity and prolonged nature of surgical interventions common today have changed this situation. Extensive operative procedures within the skull and the chest, and procedures necessarily outstandingly time-consuming within the abdomen, have enlarged the factors of anatomic derangements and increased the possibilities and severity of effects from blood loss and trauma. Their consequences on physiologic disturbances demand specialized skill in the management of anesthetized patients if successful results can be accomplished. In fact, the very possibility of an immediate successful termination requires anesthetic management not only of high technical requirements, but that it be based on a knowledge of the valuable and recent contributions from the basic

* Much of this information was taken from the pamphlet on information drawn up by the Board of Directors of The American Society of Anesthesiologists and published by them.

† Professor and Head of the Department of Anesthesiology, Hahnemann Medical College and Hospital of Philadelphia.

sciences. Similar conditions pertain to the patient in the postoperative period, or secondary to disease or accident in non-surgical patients, which, perhaps, can be better cared for by physicians trained in anesthesiology.

For these reasons, the art of anesthesia has gradually developed from simply the clever and skillful administration of drugs into a combination of art and science; art in the necessary personal contact with fellow medical practitioners, in sympathetic understanding of their problems, in the approach to patients, and in the technic of the administration of drugs; science in the prevention of harm to the physiologic welfare of patients. When necessary, the prompt and understanding treatment of physiologic depression is essential before it becomes irreversible. Thus the anesthetist of former days has evolved into the anesthesiologist of today.

I doubt very much if many of its practitioners themselves could have prognosticated the present scope of anesthesiology even a few years ago. It has enlarged to the extent that any accepted physician specialist in its active practice finds it a pleasant and thrilling experience to speak on the many services now being rendered by its participants, and the very act of enumerating them makes that speaker proud of his connection with it.

The responsibilities of an anesthesiologist today vary with the conditions and requirements of his institution. His services can augment and aid as many other aspects of the medical field, or possibly more, than many other recognized specialties. Believing that it would be of interest especially to those of you not active in the sphere of medicine, I shall first consider the relationship of a department of anesthesiology that is well established with competent personnel with the surgical department. A member of the former will visit all surgical patients preoperatively to evaluate the status of each. This evaluation by one who has observed the anesthetic course constantly and intimately at first hand of large numbers of both healthy and handicapped patients through various operative procedures has undeniable value. The selection of the anesthetic agent and the method of its administration is decided preferably by him at this time according to the physical status of each patient, with the objective toward the production of both the least harm to the patient and the greatest value in optimum working conditions to the surgeon. Up to the present time, no truly ideal anesthetic agent has been found; therefore, all agents in current usage exhibit certain by-effects. The anesthesiologist must be proficient, of course, in his knowledge of and his experience with them all; the accomplishment of anesthesia by the administration of volatile or gaseous agents by inhalation, or the injection of drugs for rectal, intravenous and block anesthesia. Following the selection of the anesthetic agent and the method of its administration, prescriptions are written for the preanesthetic sedative drugs. The objective here is psychic sedation of optimum degree to be reached by

the hour set for surgery. In consideration of it, attention is given to the anesthetic agent selected, both in type and dosage of hypnotics and sedatives, for requirements of anesthetic agents in this respect vary greatly. The anesthesiologist can frequently make valuable additional suggestions toward the preparation of the patient in other respects, which suggestions are based on his previous experiences.

During the period of surgery, anesthesia is administered not only with the objective of pain relief, but in such a manner as to provide the nearest to ideal working conditions for the surgeon. Accomplishment of these requirements is instituted primarily with all precautions taken to prevent avoidable physiologic abnormalities developing. In this way, the patient is, in reality, prepared for his convalescence during the period of anesthesia. The state of function of his respiration and circulation is observed particularly and maintained on the highest possible efficient level; he is protected, where possible, from detrimental reflex activities, and automatically and promptly rendered treatment for untoward developments during this period.

Postoperatively, the anesthesiologist is available for consultation in the recognition of and suggestion for treatment of complications. His technical ability is helpful in the administration of rectifying substances intravenously, and the application of pain-relieving methods when postoperative pain retards convalescence and recovery. By anesthetic procedures many complications are treated, as, for example, the use of spinal anesthesia for the treatment of paralytic ileus, or regional anesthesia to encourage the expulsion of secretions by coughing through the relief of postoperative pain.

From this description of the work of the anesthesiologist in the surgical field alone, it can be deduced easily that the training of the present day anesthesiologist must be a broad one. Like responsibility is placed upon his technical training, his general knowledge of medicine, and his knowledge of the basic sciences. An excellent technician will delight the surgeon during the anesthetic period, but without preparation in the other requirements, may produce a fatality by error in judgment or inability to protect the patient from the accompanying detrimental forces. A lack of technical training and extensive clinical experience can also invite disastrous consequences, no matter how extensive the knowledge of the basic physiologic and pharmacologic aspects. In these respects anesthesiology is no different from any specialty having a technical side, as, for example, surgery or any of the surgical sciences.

The recipients of broad anesthesiologic training contribute their services to other fields, as well as to surgery. Pain relief in obstetrics is not a simple one, and even as late as this year of 1946, it is not too effectively met by safe procedures. Two lives are concerned at one and the same time, both

that of the mother and the child. Although an anesthesiologist can and does treat depressive states in the newborn, his first premise should be toward avoiding it.

The general field of medicine has also received the beneficial effects of services offered by anesthesiologists. Its personnel, necessarily proficient in the application of regional anesthetic methods, is frequently called upon to administer therapeutic nerve blocks. These are beneficial in many instances, as for the treatment of pain, especially when it is intractable in character, as, for example, in inoperable cancer, or to depress autonomic nerve activity, and also for certain diagnostic purposes. The anesthesiologist constantly encounters and treats acute respiratory and circulatory disturbances in the operating room; therefore he serves as a consultant in the treatment of patients elsewhere. Aspiration of secretions from the lower respiratory tract in the medical patient as well as postoperatively can be accomplished by means of suction catheters applied through endotracheal airways. The anesthesiologist may direct therapeutic attempts involving the administration of oxygen and other gases. In many instances he is in charge of fluid therapy because of his experience in intravenous anesthesia, his experience in the application of replacement therapy in the operating room, and his continuous availability in the hospital, both for the preparation of solutions and their administration. Others are directing blood transfusion services and blood banks. A large percentage of the anesthesiologist's time is spent necessarily in the application of depressive drugs for anesthesia. Thereby he is made a most desirable individual, indeed, to have charge of resuscitation and the treatment of accidental or suicidal overdose by depressive drugs, such as carbon monoxide gas, the barbiturates, and others, by artificial airways or artificial respiration. He can well serve, also, in the treatment of convulsive states by means of the rectal or intravenous administration of sedative and anti-convulsant drugs. In these, and by many other ways, the anesthesiologist is cooperating with the members of the other departments of hospital staffs to the ultimate gain and service to the patient.

A discussion of anesthesiology today would not be complete without a few words concerning its present organizational status. Its national organization is the American Society of Anesthesiologists, Inc., with headquarters and an office staff at the present time in New York City. This Society was originally founded as a local society in 1905, and it became national in character later. In the past 10 years its membership list has grown approximately 700 per cent. In 1940, the Society initiated the publication of ANESTHESIOLOGY, its official organ, a bi-monthly scientific journal averaging 124 pages per issue. This journal has grown continuously, despite the war, until its circulation now is much greater than

its membership requirements. Research fellowships have been set up. The Society has collected and maintained a library at its headquarters' office of more than 1,000 volumes on anesthesiology. Through its Fellowship Committee, fellowships are available through the medium of both written and oral examinations. The specialty also has its certifying board, founded in 1938, by action approved by the Advisory Board of Medical Specialties. Under the supervision of this board, certification is possible, and may be secured by candidates whose work is limited 100 per cent to the specialty, and who have complied with the board's requirements. Anesthesiology has been represented since 1940 in the parent national medical organization, the American Medical Association, by the Section on Anesthesiology. The Section has shown steadily increasing attendance at its sessions, and taken an active part in the scientific exhibits at the annual meetings of the American Medical Association.

The future of anesthesiology at this time would appear to be essentially brilliant in possibilities, unless the whole medical profession is threatened by inhibiting legislation. Expansion of facilities for accepted training is a requisite. Even before World War II, the supply of trained men did not equal the demand. During the war, many surgeons of military age for the first time performed surgery under conditions provided by anesthesiologists. According to the statements of anesthesia consultants active in the armed forces, and the reports of others, the majority of these surgeons are not now willing to retrogress to former working conditions. This has resulted in a further marked discrepancy between demand and supply. Encouragement should be given to promising future graduates of accepted medical schools to enter this field. To augment it, the economic status of its clinical practice may require further modification of policy between the administrative and the professional staffs of many institutions.

In the future it is hoped that more knowledge will be presented on the fundamental nature of the anesthesia process. It was necessary for me to leave a four-day program elsewhere, celebrating this centennial year, in order to have the pleasure of being with you today. A symposium on this portion of anesthesiology had been presented at the other celebration, in which five internationally known scientists, representing research and investigation, participated. Little unanimity of thought occurred. Therefore, it is evident that opportunities for investigation are unlimited, but tremendously complex of execution. Perhaps another 100 years or more will be required before mankind will know why and by what mechanism anesthesia can be produced.

Earlier, I mentioned the fact that the truly ideal anesthetic agent has not been discovered. It may well be that such a discovery will never be accomplished, but that progress toward the improvement of anesthetic

conditions may be required by accruing a better understanding and instituting a more efficient application of the drugs now in common usage. Nevertheless, in the future, continued interest will be shown in work in this direction by such groups as are represented here at the University of Maryland by the one headed and directed by Dr. John C. Krantz.

In conclusion, it would appear that in spite of an early stunted growth, the requirements for improved medical care of the sick and injured will ever-increasingly recognize the significance of and the rôle played by anesthesiology, initiated by that first successful public demonstration by William T. G. Morton on October 16, 1846.

REFERENCE

1. RUTH, H. S.: Post-War Planning in Anesthesiology, *New England J. Med.* **231** • 669-672 (Nov. 16) 1944.

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NEWS ITEMS

Dr. Henry Rascoff, of the Class of 1928, has been elected President of the Pediatric Section of the Kings County Medical Society, New York.

The John and Mary R. Markle Foundation awarded a grant of \$3000 to the Department of Pharmacology, School of Medicine in the University of Maryland. This grant was awarded for work on the study of the excretion, metabolism, and a method for the determination of blood levels of Theophylline. The work is under the direction of Doctor John C. Krantz, Jr.

Dr. John C. Krantz, Jr., Professor of Pharmacology, gave a lecture in Yale University in the Department of Pharmacology on November 7th, on the general subject of recent advances in anesthesia.

OBITUARY

DR. FRANK WILSON JR.

Dr. Frank Wilson Jr. died of influenza on September 22, 1946, in the Duke Hospital, Durham, North Carolina. He received his B.S. degree from the University of North Carolina in 1928, and his M.D. in 1932 at the School of Medicine of the University of Maryland. He interned at the University of Maryland Hospital, the Baltimore City Hospital, and the U. S. Marine Hospital in Baltimore. In 1937 he began the practice of surgery in Raleigh, North Carolina where he remained until entering the Army Medical Corps as a captain in 1942. After his discharge in July 1946 he returned to practice—he was 37 years old at the time of his death.

Dr. Wilson was a staff member of the Rex Hospital and the Saint Agnes Hospital, and a consulting surgeon of the Seaboard Air Line Railroad and the State Hospital at Dix Hill. He was a Fellow of the American College of Surgeons, a member of the Wake County Medical Society, of the North Carolina Medical Society, of the American Medical Association, and of the Theta Kappa Psi Medical Fraternity.

Allen, Charles Lewis, Los Angeles, Calif.; class of 1887; aged 85; died, May 28, 1946, of chronic myocarditis and arteriosclerosis.

Blalock, Nathan M., Raleigh, N. C.; P & S, class of 1890; aged 79; died, August 9, 1946, of cirrhosis of the liver.

Bloom, Lawrence Hughes, Easton, Pa.; class of 1917; aged 51; died, June 16, 1946, of coronary heart disease.

Cowherd, Frank Garrett, Cumberland, Md.; class of 1908; aged 61; died, August 3, 1946.

Cutler, Frank Henry, Salt Lake City, Utah; P & S, class of 1903; aged 75; died, August 26, 1946.

Davis, Thomas Jefferson, Manning, S. C.; P & S, class of 1898; aged 73; died, July 20, 1946, of tuberculosis.

Easter, Clay M., Beckley, W. Va.; B.M.C., class of 1898; aged 75; served during World War I; died, July 6, 1946, of bronchopneumonia and carcinoma of the right tonsillar region.

Farkas, Harman H., York, Pa.; B.M.C., class of 1911; aged 56; died, May 3, 1946, of coronary occlusion, arteriosclerosis and cerebral hemorrhage.

Gulck, George Krohn, Baltimore, Md.; class of 1928; aged 50; died, July 23, 1946, of carcinoma of the colon.

Hunter, William David, Monessa, Pa.; P & S, class of 1901; aged 75; found dead in bed, May 6, 1946, of coronary occlusion.

- Mapp, James Harmanson**, Buena Vista, Va.; P & S, class of 1889; aged 80; died, July 31, 1946, of heart disease.
- Petit, Alphonse Hubert**, Ware, Mass.; P & S, class of 1890; aged 77; died, June 9, 1946, of senile gangrene, arteriosclerosis and bronchopneumonia.
- Riha, William Wordsworth**, Bayonne, N. J.; class of 1905; aged 63; died, June 30, 1946, of abdominal abscess probably secondary to carcinoma of the descending colon.
- Walsh, Frank Michael**, St. Johnsbury, Vt.; B.M.C., class of 1905; aged 72; died, June 9, 1946, of leukemia and sarcoma.
- Walter, George**, Mt. Vernon, N. Y.; class of 1910; aged 66; served during World War I; died, June 11, 1946.

BULLETIN
OF THE
SCHOOL *of* MEDICINE
UNIVERSITY OF MARYLAND

APRIL, 1947



IMPORTANT ALUMNI
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BULLETIN

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SIGMODAL IN OBSTETRICS

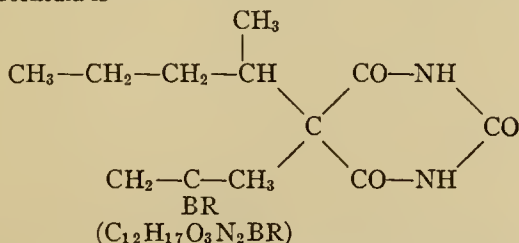
CLINICAL OBSERVATIONS WITH A REPORT OF THREE REACTIONS*†

A. M. LILIENFELD, M.D. AND D. McCLELLAND DIXON, M.D.

Modern obstetrics has been marked by increasing attempts to control the pain of childbirth. In various obstetrical services throughout the country a multitude of methods have been utilized to attain this end—morphine and scopolamine, the Gwathmey technique, nitrous oxide and ether, local anesthesia, various forms of the barbiturates and paraldehyde. Lately caudal and spinal analgesia have also received wide acclaim.

It is desired to report some clinical experiences (including three severe reactions) with an obscurely known barbiturate whose use was first investigated clinically by Emmert and Goldschmidt in 1936 (1). These same authors in 1941 reported the final results of a series of 550 cases in which this drug was used (2) and in 1942 Watson reported a series of 166 cases (3).

This preparation is marketed under the trade name of *Sigmodal*. It is put up in 10 per cent solutions stabilized by 10 per cent antipyrine, glycerine and alcohol. Chemically it is 5-sed. amyl-5-beta-bromallyl barbituric acid. Its structural formula is



* From the Department of Obstetrics, West Baltimore General Hospital.

† Received for publication February 10, 1947.

Hazelton, Koppanyi and Linegar have reviewed its chemical properties and defined its pharmacology. They concluded that it is a circulatory and respiratory depressant comparable to other short acting barbiturates. They also found that it has definite anti-convulsant properties (4).

Sigmodal, as the name implies, is administered rectally, is absorbed rapidly and has no irritating effects on rectal mucosa, thereby making its retention easy. Previous reports state that the maximum concentration in the blood stream is reached about one to two hours after administration (2). As occurs in all barbiturates the drug is probably decomposed in the liver and is largely eliminated by the kidney. Clinically the effect of sigmodal manifests itself twenty to thirty minutes after administration when given alone. However, when used in conjunction with another barbiturate such as seconal, it usually takes effect in five to fifteen minutes. Sigmodal produces both analgesia and amnesia with the latter outweighing the former effect.

METHOD OF ADMINISTRATION

Sigmodal is administered through a thin No. 14 urethral catheter. In order to facilitate nursing routine a "Sigmodal tray" has been set up consisting of the following:

1. A white enameled basin containing several No. 14 catheters
2. A Dakin cup
3. A 10 cc. syringe
4. A tube of lubricant

The sigmodal (which is obtained in 10 cc. vials and in 100 cc. bottles) is kept refrigerated, and, when ordered, is placed on the tray by the nurse. It is particularly important that the patient have an empty bowel. It has been the routine to give 3 grains of seconal when the patient becomes uncomfortable and sigmodal when cervical dilatation is about four centimeters in a primigravida or in a multigravida when uterine contractions are lasting at least thirty five to forty seconds, regardless of cervical dilatation. The patient is placed in a lateral position with the thighs flexed on the abdomen and the legs on the thighs. Immediately following a uterine contraction, a well lubricated catheter is inserted into the rectum and guided above the presenting part by means of a gloved index finger. The 10 cc. of sigmodal, which has been previously drawn into the syringe, is injected through the catheter and followed by 10 cc. of tap water to wash out any solution remaining in the catheter. The catheter is then immediately withdrawn. The patient is instructed to hold her legs straight out and close together and to breathe through her mouth. Retention may also be aided by holding or taping the buttocks together. Within five to fifteen minutes the patient shows increasing signs of drowsiness and will generally fall asleep. The

sides of the adult crib are placed into position, as a small percentage of individuals are restless during uterine contractions. It is sometimes necessary to give secondary administrations, but of not more than five cc. every three or four hours.

In about 90 per cent of the cases delivery is accomplished by episiotomy and the use of control low forceps. The anesthesia is usually nitrous oxide, oxygen and occasionally ether. Pudendal block and low spinal seems more successful with sigmodal.

After three patients were observed with severe respiratory depression immediately following delivery, the routine was modified. If the sigmodal alone did not produce the desired amount of analgesia, 100 mgm. of demerol intra-muscularly was supplemented. Since then there have been no similar reactions.

ANALYSIS OF CASES

A total of 391 patients, who had sigmodal administered during labor, were studied. Some of these patients received the seconal-sigmodal routine; some received sigmodal alone, and others received sigmodal and demerol intra-muscularly. As one group the following effects were noted.

1. Effect on Blood Pressure, Pulse, Respiration and Fetal Heart Rate

A series of 22 cases was studied. The blood pressure, respiration, pulse of the mother, and the fetal heart rate were taken prior to administration of sigmodal and at hourly or two hour intervals until delivery. The results showed no appreciable effects on these variables. In fact in some cases when there was an elevated blood pressure as a result of excitement there was a noticeable decrease following the full effects of the drug. These findings coincide with those of Emmert and Goldschmidt (20).

2. Effect on Memory

A total of 223 cases was analyzed as to the amnesic effect. This was accomplished by asking the patients what they remembered subsequent to the administration of the drug. This question was usually asked on the first or second day post-partum. The answers were classified in the following four groups.

1. Complete amnesia. The patient did not remember anything.
2. Almost complete amnesia. The patient remembered a few individual events such as being brought into the delivery room etc.
3. Partial amnesia. The patient remembered very hazily a few pains and a few questions which were asked her during labor.
4. No amnesia. The patient had a fairly good recollection of the course

of events after the administration of the drug. These results are tabulated in Table I.

There were twelve patients not included in Table I because they immediately expelled the drug or were delivered just after its administration. The above results are similar to those reported by Emmert and Goldschmidt (2). They found that in primigravidas satisfactory amnesia was obtained in 94.4 per cent cases and poor in 5.6 per cent of cases. In multigravidas they had 88.9 per cent cases with satisfactory amnesia and 7.4 per cent cases with poor amnesia. Irving reported 85 per cent satisfactory amnesia with barbiturate-scopolamine (5). Schuman reported about 70 per cent satisfactory amnesia with demerol-scopolamine (6).

TABLE I
Showing amnesia in 223 cases

GRADE OF AMNESIA	NO. OF PATIENTS	PER CENT OF PATIENTS
Complete.....	168	75.3%
Almost Complete.....	18	8.1%
Partial	18	8.1%
None.....	19	8.5%
Total.....	223	100.0%

3. Effect on the Length of Labor

Emmert and Goldschmidt found that the total average labor in primigravida was 12 hours and 4 minutes and in multigravida 6 hours and 15 minutes (2).

4. Effect on Post-Partum Hemorrhage

Many obstetricians feel that analgesic and amnesic agents have a relaxing effect on the uterus and pre-dispose to post-partum hemorrhage. In this series of 391 cases only five patients (1.3 per cent) showed post-partum hemorrhage in each of which the bleeding varied from 500 to 700 cc. and was readily controlled by oxytocic agents.

5. Effect on the Infant

A. Resuscitation. This is divided into three types which are called Major, Minor and Immediate. The infants classified under Immediate are those who cry immediately upon birth and require only a slight amount of suctioning. The Minor group are those who require suction and inhalation oxygen. The Major group are those who require positive pressure

resuscitation using a Kresselman-Heidbrink resuscitator. The results are tabulated in Table III.

It is noted from this table that 83.6 per cent of the infants did not require any active resuscitation. In only a few cases of the remaining 56 babies were there asphyxia pallida.

Irving states that 62 per cent of infants may be expected to breathe immediately with barbiturate-scopolamine and 82 per cent with demerol-scopolamine, when these are combined with general anesthesia. He mentions the administration of $\frac{3}{4}$ grain of ephedrine sulfate to the mothers as a method of decreasing the percentage of infants with delayed respirations (5).

TABLE II

Showing average total length of labor according to parity

NUMBER OF PATIENTS	PARITY	AVERAGE TOTAL HOURS OF LABOR
183	Primigravida	16 hours
208	Multigravida	9.7 hours

TABLE III

Showing type of Resuscitation of 341 Infants

TYPE OF RESUSCITATION	NUMBER OF INFANTS	PERCENTAGE OF INFANTS
Major.....	56	16.4%
Minor.....	139	40.8%
Immediate.....	146	42.8%
Total.....	341	100.0%

Although not included in this report, this clinic has recently been using low spinal-saddle block anesthesia instead of an inhalation anesthesia for delivery. It has been observed that very rarely does an infant need any resuscitation regardless of the analgesic agent used during a normal labor.

STILLBIRTHS AND NEONATAL DEATHS

Of the 391 deliveries there were five stillbirths and two neonatal deaths—a total infant loss of 1.8 per cent. We have listed in the protocols the cause of death in each of these cases. It is noted that in only one case (L 340) could there be any possible association of fetal death with the drug employed. This was an uneventful delivery which resulted in a stillbirth, the autopsy of which showed bilateral atelectasis.

Protocol I. Stillbirths

- L 31 Pre-eclampsia mild. Macerated fetus.
- L 340 Uneventful delivery. Autopsy showed bilateral atelectasis.
- L 754 Erythroblastosis Fetalis.
- L 1360 Erythroblastosis Fetalis. Macerated fetus.
- L 1705 Dystocia dystrophy syndrome. Positional disproportion. Prolonged labor.
Death of fetus during labor. Decapitation.
- L 2375 Tracheo-oesophageal fistula.
- L 2409 Hemorrhagic disease of the new born; Intrahemorrhage; broncho-pneumonia.

UNTOWARD REACTIONS

There are several types of untoward reactions which were observed to occur in patients following sigmodal administration.

1. *Excitement.* A certain percentage of patients receiving any barbiturate will become unduly excited and restless. Various means are utilized to control this excitement. Emmert and Goldschmidt use dilaudid gr. $\frac{1}{4}$ (2), Jones uses morphine sulfate gr. $\frac{1}{6}$ (7), Irving uses demerol 100 mgm. intramuscularly and he mentions the use of apomorphine gr. $\frac{1}{100}$ (5). The use of 100 mgm. of demerol has been successful.

2. *Muscular twitchings.* Some patients will show twitching of the muscles. This may be mild or severe. It occurs in only a small percentage of patients and does not appear to have any deleterious effects. Demerol has been useful in controlling these.

3. *Respiratory depressant action.* In this series there were three cases of severe respiratory depression. These three cases all occurred within a period of six weeks. Prior and subsequent to this time similar difficulties were not encountered. Because these reactions occurred within such a short time they may have been caused by the particular stock of the drug at the time. Another factor that may have played a rôle was overdosage, which will be discussed more fully below.

The summaries of the clinical histories of these patients are presented here because of the importance of this type of reaction.

Case 1. L. K. (L 3342). This patient was a 31 year old multigravida, weighing 149½ pounds, who was admitted to the hospital at 6:30 A.M. 10/13/45. At 10:35 A.M. a rectal examination showed the cervix to be 4 centimeters dilated and the fetal head at the spines. The patient received 3 grains of seconal and 10 cc. sigmodal. Two and one-half hours later she was delivered of a full term, living male child by means of low forceps and central episiotomy under a general anesthetic consisting of nitrous oxide and oxygen. The third stage was uneventful. The postpartum blood pressure was 100 systolic over 65 diastolic. She was given oxygen for about twenty minutes in order to revive her from the anesthetic. One hour and three minutes postpartum she began having tonic convulsions of the entire body and was markedly cyanotic. Her pulse was 60, blood pressure 90 systolic over 65 diastolic and respirations 20. She was given oxygen and both the convulsions and cyanosis disappeared but the patient remained deeply narcotized. She had a positive bilateral Babinski and positive bilateral Hoffman's sign. She was then given 4

ampules of coramine intravenously, $\frac{3}{4}$ grain ephedrine sulfate intramuscularly and 1,000 cc. of glucose was started intravenously. When mucus appeared in the upper respiratory tract, the lungs were examined and there were some coarse rales on the right side at the base, but the left side was clear. The heart was normal. She was given 2 ampules of coramine intramuscularly and carbon dioxide and oxygen inhalations were given and continued at intervals of several hours. She also received 1 ampule of coramine intramuscularly every four hours for five doses. That evening the patient continued to sleep and did not awaken until the following afternoon, at which time she was drowsy. She was completely awakened on the second day following the reaction. The remainder of the post-partum course in the hospital was normal.

Case 2. M. G. (L 3451). This patient was a 22 year old primigravida, weighing 134 pounds, who was admitted to the hospital at 5:40 A.M. 10/23/45. Labor progressed normally and at 4:15 P.M. when the cervix was 4 centimeters dilated she received $4\frac{1}{2}$ grains of seconal followed by 10 cc. of sigmodal. Approximately 4 hours later she was delivered of a full term living female child by means of low forceps and central episiotomy. During delivery she received nitrous oxide, oxygen and a small amount of ether. The postpartum blood pressure was 112 systolic over 70 diastolic. Thirty three minutes postpartum the patient had clonic convulsions of the extremities, and her respirations were shallow and irregular. The pupils were widely dilated and did not react to light. The patient had a bilateral positive Hoffman's sign and a negative Babinski. The hands and feet were cold but not cyanotic. She was placed in Trendlenberg position, continuous oxygen was started and one ampule coramine was given intravenously. Under oxygen the convulsive seizures ceased and oxygen was continued for about an hour. The oxygen was then given for five minutes every hour for three hours, with the patient remaining asleep during this entire time. Sixteen hours post-partum she was given 1 ampule of coramine intramuscularly and $\frac{3}{4}$ grain of ephedrine sulfate intramuscularly. Her pulse, respiration and blood pressure were normal at this time. The pupils were dilated and the patient responded to questioning by opening her eyes. She received another ampule of coramine intramuscularly during the day and remained asleep during the next twenty four hours beginning to arouse thirty hours post-partum. She was awake during the entire next day. The post-partum course was normal except for a mild pyelitis.

Case 3. I. S. (L 3875). This patient was a 24 year old primigravida, weighing 129 pounds, admitted to the hospital at 8:30 A.M. 11/30/45. Three and one half hours later when the cervix was 4 centimeters dilated and the fetal head at the spines she was given 10 cc. of sigmodal. Three and one half hours later the patient spontaneously delivered a full term living female child by means of a central episiotomy. During the delivery she received nitrous oxide, oxygen and ether. At 4:20 P.M., fifty minutes post-partum, on her return to the room, she had a marked tonic twitchings of her extremities and was mildly cyanotic. The blood pressure was 82 systolic over 40 diastolic. Her pupils were dilated and there was a bilateral horizontal nystagmus, a bilateral positive Hoffman sign and bilateral unsustained ankle clonus. After the initial tonic seizure, which lasted a few minutes, she had some mild athetoid movements of the extremities. She was placed in Trendlenberg position, blankets were applied and she was given $\frac{3}{4}$ grain of ephedrine sulfate intramuscularly and two ampules of coramine intravenously. The cyanosis disappeared and by one hour and fifteen minutes post-partum, the athetoid movements and neurological signs were absent. Her blood pressure at this time was 130 systolic over 64 diastolic. The pulse and respirations remained normal throughout the day and toward evening, the patient began to awaken and did not require any further therapy. The following morning she was wide awake. The remainder of her post-partum course in the hospital was normal.

DISCUSSION

The first two patients received both seconal and sigmodal. As a result of these two reactions, seconal has been eliminated from the routine and only sigmodal is given. If the sigmodal does not have the desired analgesic effect it is supplemented with 100 mgm. of demerol intramuscularly from one half to one hour after the administration of the sigmodal.

The third case received only sigmodal. This case raised the question as to the method of giving ten cc. of the drug, regardless of the patient's size, since this particular patient was smaller than average. As a result of this attempts are being made to do blood level determinations to arrive at a dosage scheme which will take the body weight of the patient into consideration. While this study is in progress estimations of dosage in accordance with the size of the patient are being made, e.g., if the patient is 130 pounds or less, on admission, seven to eight cc. of sigmodal rather than ten cc. are administered.

All of the reactions occurred post-partum, each patient receiving nitrous oxide and oxygen, and, in addition, two of the three were given ether anesthesia for the delivery. The synergistic effect of the nitrous oxide and sigmodal causing anoxemia may be the cause of these reactions. The substitution of pudendal block or low spinal for the inhalation anesthesia has recently eliminated this complicating factor.

To combat these respiratory depressant actions of the drug such respiratory stimulants as coramine and ephedrine are used. The patients are given oxygen depending on whether or not cyanosis is present. Intravenous fluids are also beneficial in that they decrease the blood level of the drug by increasing its excretion in the urine.

SUMMARY AND CONCLUSIONS

Sigmodal has been studied in a series of 391 patients to determine its value as an amnesic agent in labor and any untoward effects it has on the Mother or baby.

1. Satisfactory amnesia was obtained in 91.5 per cent of patients. This compares favorably with other barbiturates being used and with demerol-scopolamine.

2. The average labor for primigravida was sixteen hours and for multigravida it was nine and seven tenths hours. This is slightly higher than those reported with other agents.

3. The incidence of post-partum hemorrhage was 1.3 per cent.

4. In this series 83.6 per cent of the infants did not require any active resuscitation. The substitution of pudendal or saddle block for inhalation anesthesia for the delivery may eliminate the need of any resuscitation.

5. The summaries of three cases showing marked respiratory depression

were presented. This may have been caused by the variations in the drug, but probably to overdosage, and the added anoxemia effect of nitrous oxide. The question of over-dosage is being investigated at the moment by means of blood level determinations.

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ACUTE PUERPERAL INVERSION OF THE UTERUS*†

WITH TWO CASES SEEN AT CESAREAN SECTION

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Two observations, which do not appear to have been presented before, will be offered for consideration. These observations are 1:—Cesarean inversion or an inversion of the uterus through the uterine incision, and 2:—recognition of a partially inverted uterus while routinely inspecting the cervix.

INCIDENCE

The incidence of uterine inversion, during or immediately following the third stage of labor, has been variously reported from 1-2000 (Kehrer) (1) to 0-250,000 (Beckmann) (2). Stander (3) reports 1-4000, Cosgrove (4) 1-4333, Davis and Maxwell (5) 1-6500, Irving (6) 1-7837. In this report, in which 4 cases were from one hospital and 6 cases from another, the incidence for the combined group was 1-3802.

ETIOLOGY

Etiologically, it is generally contended that there are predisposing factors and exciting factors. It is also agreed that the uterus must be conditioned by distention and relaxation with a full dilatation of the cervix. There may be in addition a congenital weakness, weakness of the uterine wall at the placental attachment, and failure of proper innervation or disturbance in the conducting mechanism of the uterus. Harer, Benson and Sharkey (7) graphically describe some of these predisposing factors as follows:—"In those cases in which the placenta is attached to the fundus of the uterus there is a thinning of this portion of the wall of the uterus and a softening caused by the increased vascularity, which results in imperfect contraction of the fibers and production of a 'dimple' which predisposes to inversion of the uterus. In other cases there appears to be some abnormality of the innervation of the uterus which results in an abnormal contraction of the uterine muscle fibers and production of 'inert' areas or areas of softening in the uterine wall."

There is considerable disagreement concerning the exciting causes. Cosgrove (4) feels they are largely the result of mismanagement; Holmes (8)

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feels that this is not the cause, but that temporary abnormalities of the tone of the uterine muscle are responsible, and thus the inversion is actually spontaneous. Das (9) feels trauma and spontaneity are both incriminated. Salvin (10) considers that predisposing factors are necessary, but that mismanagement, manual removal of the placenta and increase in intra-abdominal pressure are most important exciting causes. The two case reports that follow seem to bear out the fact that inversion can occur both spontaneously, and with mismanagement.

Case 1. A 34 year old white para 1 was admitted to the hospital 2/26/45 because of hypertension in the thirty-second week of pregnancy. Her first pregnancy had been complicated by severe pre-eclampsia which resulted in premature termination. On this admission the patient was treated for toxemia medically for several days without response so the pregnancy was terminated by laparotrachelotomy on 3/7/45. Ergotrate was given intravenously after delivery of the baby. The operator thought that the placenta had separated, so he made traction on the cord, inverting the uterus through the incision. The placenta was then peeled off and the uterus re-inverted. It contracted normally. The patient's postpartum course was uneventful.

Case 2. A 17 year old colored para 1 was admitted to the hospital 8/18/43 in labor at term. Her first pregnancy was terminated by classical cesarean section on 7/6/42 because of cephalopelvic disproportion. A severe postpartum infection followed. Roentgen pelvimetry confirmed a contracted pelvis with this pregnancy, and after admission the patient was delivered by laparotrachelotomy. Ergotrate was then given intravenously. A dimple formed in the fundus. It became deeper with each contraction of the uterus, until a complete inversion through the uterine incision occurred. At no time was there traction of the cord, the inversion being spontaneous. After inversion, the placenta separated of its own accord. The uterus was then reinverted and packed. The patient's postpartum course was again febrile, but she was discharged in good condition after three weeks' hospitalization.

The first case was definitely traumatic and shows that when the predisposing conditions are present, traction from below on the cord can be an etiologic factor in causing uterine inversion.

Most obstetricians, believing that the placenta has separated, have made traction on the cord at cesarean section without inverting the uterus. Apparently the predisposing factors must be present, and trauma is an exciting cause.

The second case occurred spontaneously as reported. The only factor that must be considered was the giving of ergotrate, intravenously, before placental separation. The uterus, placenta, or cord was not manipulated either before, during or after inception of the 'dimple'. It was observed from onset to complete inversion through the incision without any interference. Placental separation took place while the uterus was inverted. One may well argue that the ergotrate was the exciting cause. This conclusion is doubtful. No other reference was found considering oxytocic drugs as an exciting cause in this obstetric complication.

These two cases may contribute to an analysis of the conclusions drawn by various observers:—one in which the argument concerns meddlesome obstetrics only as an exciting cause, and the other in which it is maintained that the pathologic process is entirely spontaneous. These two cases seem to verify both hypotheses.

DIAGNOSIS

The pathology and pathologic sequence are both very excellently described in a paper by Cosgrove (4) and will not be discussed here. There is one point in the early diagnosis of partial inversion of the uterus which we would like to discuss. The complete inversion is so easily recognizable that its diagnosis will not be considered. The diagnosis of the partial type, on the other hand is frequently made only after the condition has been present for several hours. At such a time the patient is in shock and a sterile pelvic examination is done with the intention of packing the uterus for postpartum hemorrhage. The 'dimple' is frequently missed in the fundus of the uterus. The hemorrhage often is not severe so that many patients leave the delivery room before the diagnosis is made. The diagnosis is made several hours after the inception of the condition when the patient has gradually and insidiously arrived at the level of shock. However, there is one method by which the diagnosis cannot be missed. This will be discussed after the following histories.

Case 3. A 26 year old white para 0 was admitted to the hospital at 1:15 A.M. 6/6/42 at term in active labor. The uterine contractions progressed rapidly and at 4:55 A.M. the patient was delivered spontaneously following a central episiotomy. After much trauma and moderate blood loss the third stage was completed twenty-seven minutes later. Oxytocics were given and the patient continued to bleed moderately. An hour after delivery her bleeding became almost normal, but her pulse was 130. Bleeding then recurred and three and a half hours later the patient was in profound shock. A consultation was requested at which sterile pelvic examination revealed a partially inverted uterus. Plasma and whole blood administration had been started previously. A pack was introduced into the vagina which replaced and completely re-inverted the uterus. More blood and plasma were given, however the patient died 5½ hours postpartum.

Case 4. A 25 year old white para 0 was admitted to the hospital at 11:45 P.M. 6/26/43 in active labor at term. Contractions progressed normally and after fifteen hours of labor the patient was delivered by low forceps following a medio-lateral episiotomy. The third stage was completed without difficulty by the Credé method. There was some excess bleeding and her pulse became rapid. Intravenous glucose was started, more oxytocic drugs given, and at two and a half hours postpartum, the patient's pulse could not be obtained. Plasma and whole blood were given. Consultation was requested four and a half hours postpartum. A sterile pelvic examination revealed a partial inversion of the uterus. This was easily reduced and the uterus packed, however, five and a half hours postpartum the patient's heart stopped.

Case 5. A 19 year old white para 0 was admitted to the hospital at 11 P.M. 5/6/40 in very early labor. Uterine contraction progressed normally and at 4:25 P.M. 5/7/40, she was delivered by low forceps, following a central episiotomy. With some difficulty, using the Credé method, the 3rd stage was completed fifteen minutes later. She began to bleed profusely. A pelvic examination revealed a partially inverted uterus. This was reduced easily by taxis. No shock was experienced. Her postpartum course was complicated by a mild thrombophlebitis, but she was discharged in good condition.

Case 6. A 25 year old white para 2 was admitted to the hospital 1/10/37, after having been delivered at home six hours previously, because of postpartum hemorrhage. Pelvic examination revealed a partial inversion of the uterus. This was easily replaced by taxis. After blood transfusions the patient's postpartum course was uneventful, and she was discharged in good condition.

Case 7. An 18 year old white para 1 was admitted to the hospital 7/31/39, in the thirty-second week of her pregnancy because of ruptured membranes. She started spontaneously in labor the same day and was delivered by low forceps following central episiotomy at 12:57 A.M. 8/1/39. After completion of the third stage which was terminated by the Credé maneuver, routine inspection of the cervix revealed a partial inversion. There was no abnormal bleeding. The uterus was easily replaced by taxis. The patient was discharged in good condition after an uneventful puerperium.

Case 3 and case 4 were handled very poorly because the proper diagnosis was not made, and shock therapy was not immediately instigated. The diagnosis, however, in both these cases was the important factor; and if correctly made, the unfortunate outcome could easily have been avoided. Actually shock could have been avoided. Both of these uteri were replaced while the patients were in profound shock. A better result may have been experienced if shock had been treated first. In Case 5 the diagnosis was made promptly and immediate treatment instituted, emphasizing the importance of early diagnosis before shock. The diagnosis was made at pelvic examination only because the patient began to have signs in the form of severe hemorrhage. If the hemorrhage had not occurred (and inversion does occur without hemorrhage) the diagnosis would without a doubt, have been delayed. In Case 6 the important factor of prompt diagnosis was not accomplished, and the treatment of shock before replacement was not adhered to. This patient was fortunate in spite of treatment. The last case presented the simple and harmless procedure of *routine inspection of the cervix* which accomplished the diagnosis of partial inversion before there was any chance of post-partum hemorrhage, shock, or other complicating factors. This procedure is now done routinely at the obstetric clinic of the School of Medicine, University of Maryland.

It is felt that routine cervical inspection has, in addition, two real values: 1. Not infrequently membranes that are retained, following completion of the third stage, can be seen lying within or protruding slightly through the

cervix. If found they can be removed very simply under direct vision. 2. The main reason for cervical inspection has been the discovery of cervical lacerations. Lacerations of the cervix are repaired because of the possibility of hemorrhage from them and because it has been found that the majority of repairs "hold" and the cervical os at six weeks' examination is free of indentation from laceration and presents a smooth, uninterrupted oval os, in contra-distinction to the usual bilateral or stellate laceration which may or may not be infected. The procedure diminishes the number of cases of cervicitis seen later.

No more will be said concerning this procedure, except to emphasize that it will invariably, in addition to presenting other valuable pathologic signs attributable to delivery, make the diagnosis of partial inversion of the uterus.

Three other cases will now be presented to complete the cases of uterine inversions seen in these two hospitals.

Case 8. A 26 year old white para 2 was admitted to the hospital at 12:00 A.M. 3/31/46 in advanced labor at term. She was delivered by low forceps, following central episiotomy at 12:48 A.M. 3/31/46. By Credé method the placenta was expressed at 1:23 A.M. and a complete inversion of the uterus immediately followed. Immediate replacement was not successful. Plasma and blood was begun. The patient's blood pressure was 80 systolic over 60 diastolic. At 2:45 A.M. under cyclopropane anesthesia a laparotomy was done. By using Allis clamps the uterus was gradually brought up into the abdominal cavity. Constant pressure was made from below. The uterus responded to oxytocics after replacement. Her blood pressure rose immediately to 110 systolic over 70 diastolic. Penicillin and sulfadiazine were administered and her course was uneventful. She was discharged in good condition. The patient was readmitted on her twenty-fifth postpartum day with thrombophlebitis and pulmonary embolism. She again responded and was discharged in good condition.

Case 9. A 24 year old white para 1 was admitted to the hospital 6/17/44 in active labor. After forty hours of inertia labor an occiput posterior was delivered as such, by low forceps, following a central episiotomy. With suprafundal pressure a "dimple" formed and a complete inversion resulted. An adherent placenta was manually separated, and the uterus replaced by taxis. A laceration of the cervix was repaired. No shock occurred. There was a 250 cc blood loss. Her postpartum course was uneventful.

Case 10. A 23 year old para 0 was admitted to the hospital 9/9/46 in active labor, which progressed normally. The patient was delivered by low forceps and episiotomy after ten hours. The placenta was expressed by the Credé maneuver which was followed by immediate complete inversion. The uterus was replaced immediately by taxis. There was a 300 cc blood loss without shock and an elevation of temperature the following day to 102 F, and thereafter she became afebrile. The patient was discharged after ten days in good condition.

TREATMENT

These three cases serve to emphasize that not only is early diagnosis, but also early and immediate treatment, the best therapy, excluding, of course,

prevention. Gentle handling of the third stage will go far to prevent inversion. The majority of times the Credé maneuver seems to be at fault. The following has proved to be a satisfactory substitute:—1. Ergotrate is given intravenously with the delivery of the anterior shoulder; 2. The fundus is *not* massaged. 3. A pelvic examination, by feeling the placenta in the vagina, discloses placental separation. 4. The Brandt maneuver expresses the placenta without fundal pressure. The diagnosis in case 8 was readily made, but the treatment was procrastinated. Case 9 and 10 were treated ideally. Immediate taxis is certainly a good treatment of inversion. Neither of the cases treated immediately were in any difficulty at any time as far as infection, hemorrhage and shock were concerned. The case in which treatment was procrastinated, shock was the outstanding symptom, and here it may be noted that the shock completely disappeared as soon as the uterus was replaced to its normal station. There was very little hemorrhage associated with case 8. Is it possible that the traction on peritoneum, blood vessels and nerves be sufficient to cause shock, when a uterus is inverted? This question may be worthy of study in attempting to arrive at the proper treatment. If taxis is sufficient, reinversion immediately, should be the treatment of choice. Several authors feel that procrastination yields better results than immediate replacement, the replacement, being done days later, after involution of the uterus.

REITERATION

1. Apparently uterine inversion can occur spontaneously.
2. Most inversions, however, are probably caused by mismanagement.
3. Routine use of cervical inspection may prevent a catastrophe for some mothers by enhancing early recognition of a partial inversion of the uterus.
4. Early recognition and immediate replacement seems to be a satisfactory method of treatment. In the majority of cases, these two factors may prevent shock, the most important factor as a cause of death.
5. If the patient is in shock, when the diagnosis is made, the shock is treated first.
6. A satisfactory substitute for the Credé method of handling the third stage is presented.

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PLASTIC REPAIR OF DEFORMITY OF PENIS DUE TO GRANULOMA INGUINALE*†

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Much has been written in the past score of years regarding granuloma inguinale, but little has been reported in relation to its plastic repair following the terrific deformities it may cause to the male genitalia, especially the penis. Shelley (1) in 1940 reported the results of a case with "pinch" grafts. Toulson (2) in 1944 reported the use of "pinch" grafts as a satisfactory method of epithelializing a widely denuded area of the penis.

CASE REPORT

The case being reported is most extraordinary in that the granulomatous process completely obscured the entire penis, enveloping it to such an extent that urination was impossible and acute retention resulted.

Although treated from July 26, 1944 regularly and most thoroughly in the Department of Dermatology, the scar formation and granulation tissue grew over and enveloped the patient's entire penis to such an extent that there was but a tiny fistula in the granulation for him to pass urine through which was done with difficulty. This fistula extended from the external urinary meatus through dense granulation tissue for about 3 cm. to the external opening.

On the night of September 16, 1944, the small fistula closed and, suffering with acute retention of urine, he applied for relief at Franklin Square Hospital, where he was admitted. It was impossible to pass the smallest filiform through the fistula and, as the patient's bladder was distending above his umbilicus, a suprapubic section was done under gas-ether anesthesia and a dePezzer tube inserted into the bladder.

For several days following the operation, the condition of the patient was critical. Large doses of sulfadiazine were ineffectual. Penicillin was then given continually intravenously by the drip method, which in a few days brought relief of the toxic symptoms.

On November 24, 1944, the patient was discharged and returned to Dermatologic Clinic of the University of Maryland, where he was treated with tartar emetic and neoarsphenamine, as the Kline blood test was positive. He was also watched in the Urologic Clinic for the care of his suprapubic tube and bladder condition.

For the first three months no difference could be noted but after that softening of the granulomatous tissue of the scrotum could be noticed. Therefore, it was considered advisable to continue treatment of tartar emetic before attempting a plastic repair of the scrotum. In November of 1945, it could be observed that the softening of the parts was reduced to a minimum although the penis could not be palpated through the granulomatous mass.

On November 27, 1945, the patient was admitted to the South Baltimore

* From the Department of Urology, School of Medicine, University of Maryland.

† Received for publication December 1, 1946.

General Hospital and, under sodium pentothal anesthesia, several additional granulations which had formed in the inguinal folds (Figure 1) on both sides were excised with the electric knife, using the bipolar current. The sections from tissue removed did not contain Donovan Bodies nor the cells of Greenblatt and Pund. However, there was such a preponderance of inflammatory tissue that the bodies and cells might have been obscured.

On January 12, 1946, under spinal anesthesia, the suprapubic tube was removed. The bladder was carefully searched for calculous formation on



FIG. 1. The entire penis enveloped in granulomatous mass. Additional granulations forming in inguinal folds.

account of the prolonged use of the dePezzer tube, although roentgenographs for calculi were negative for vesical calculous formation the day prior to the operation. A new dePezzer 34 was inserted in the bladder.

Then an incision was made in the mid-scrotal line and the granulomatous tissue was carefully dissected until the finger of the operator could palpate the penis. The glans penis was matted firmly in the granulation tissue and this was first delivered. Then the shaft of the penis was dissected free from the mass and delivered into the upper angle of incision. The skin of the penis had been entirely denuded by the infectious process.

An attempt to pass a 16F Foley catheter through the urethra into the

bladder failed. Filiforms were used and finally one entered the bladder. This was followed with a 16F follower, then 18F, then 20F and 22F followers, after which an 18F Foley was passed into bladder.

The skin and granulomatous tissue of the scrotum were approximated with through and through interrupted sutures of silver wire, except at the base of the penis where the newly formed penile-scrotal juncture was approximated with interrupted sutures of silkworm gut.



FIG. 2. Skin grafting of penis by technic of Thiersch.

From the time the patient was admitted to the South Baltimore General Hospital, all through his preoperative treatment and postoperative treatment, he was treated three times weekly with fuadin in doses of 3 c.c. and once weekly with 0.6 gm. neoarsphenamine. For three days postoperatively he was given penicillin 40,000 units every two hours intramuscularly. Following this operative procedure, his bladder was irrigated with normal saline solution through the urethral catheter and the suprapubic tube every 2 hours day and night.

On February 8, 1946 under spinal anesthesia, the penis was skin-grafted using the technic of Thiersch,—several pieces of skin being removed from the outer surfaces of both thighs and placed around the shaft of penis.

Following the skin-grafting, it was deemed inadvisable to remove either the suprapubic tube or the Foley catheter, fearing the grafted surfaces would be infected with urine.

The vaseline gauze dressing was removed ten days later and all grafts had "taken." On this day the dePezzer tube was removed and suction applied to the Foley catheter for one week to facilitate suprapubic wound healing. The catheter was then removed and the patient voided a stream of good calibre. He was discharged from the hospital on March 15, 1946.

Since then the patient has been treated in the Dermatological Clinic of the University of Maryland with tartar emetic and neoarsphenamine and has been seen periodically in the Urologic Clinic for dilatation of the urethral stricture.

The writer wishes to express grateful acknowledgement to Dr. Harry M. Robinson, Professor of Dermatology in the Medical School of the University of Maryland; Dr. Omar T. Pace, former Resident in Surgery at the Franklin Square Hospital; Dr. F. Drennan Gassaway, former Assistant Resident in Surgery at South Baltimore General Hospital; Dr. Joseph M. White for the photography; and Dr. Edward A. Kitlowski for consultation.

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NEWER PHASES OF GASTRODUODENAL ULCER*

GEORGE B. EUSTERMAN, M.D.

Division of Medicine, Mayo Clinic, Rochester, Minnesota

INTRODUCTION BY DR. MAURICE FELDMAN

Before presenting the speaker of the evening, I would like to call to mind the man in whose honor this lecture is given. The Dr. Julius Friedenwald Memorial Lecture was made possible by the generosity of Doctor Friedenwald's wife, his numerous friends and colleagues. We felt that the establishment of a yearly lectureship with the presentation of some gastrointestinal subject would be a lasting and fitting memorial to the late Doctor Julius Friedenwald. It was the specialty to which he devoted his life and contributed so much. Dr. Friedenwald's ability as a doctor was recognized by all. He was a scientist, teacher, writer, and a physician who not only loved, but who truly lived for his profession. He was an inspiration and guide to all of us who were fortunate in being associated with him. Besides his professional attainments in gastroenterology Doctor Friedenwald endeared himself in the hearts of his colleagues and fellow citizens. As a tribute to him, a yearly memorial lecture will be given at the University of Maryland, School of Medicine, where he faithfully served as professor of gastroenterology.

It seemed most appropriate that Dr. George B. Eusterman, a close friend and admirer of Doctor Julius Friedenwald be selected to give the first annual Doctor Julius Friedenwald Memorial Lecture. Dr. Eusterman's preeminence in gastroenterology is known throughout the world. He is one of the leading pioneers in this branch of medicine. He is a prolific writer and has written one of the best books on the stomach and duodenum.

Doctor George B. Eusterman is professor of medicine at the University of Minnesota and head of the gastroenterologic section at the Mayo Clinic. To many in the audience Doctor Eusterman needs no formal introduction. It gives me a great personal pleasure and honor to present Doctor George B. Eusterman, who will speak on "Newer Phases of Gastroduodenal Ulcer."

It was with mingled feelings of pride and pleasure that I accepted your kind invitation to deliver the first memorial Julius Friedenwald lecture. The subject chosen for this address—gastroduodenal ulcer—is one that was very close to his heart, and one to which he made numerous enduring contributions.

* Abstract of the "Julius Friedenwald Memorial Lecture," presented at the University of Maryland, School of Medicine, on November 14, 1946.

Incidence. An analysis of our cases revealed a ratio of one gastric ulcer to 12.5 duodenal ulcers. The sex distribution showed both gastric and duodenal ulcer predominate in the male sex. On the basis of hospital admissions and personal observations the impression prevails that there is an actual increase in the incidence of peptic ulcer.

There is a preponderance of duodenal ulcer in this country in comparison to Europe and a relatively greater incidence of gastric ulcer among women on the European continent.

Pathogenesis. It is not at all improbable that the major facts of the genesis and development of ulcer have been established, and that there only remains the solution of the problem to be achieved by selection of the proper pieces and fitting them into the mosaic according to their importance and interrelationships. The importance of the rôle of the chemical and digestive properties of the gastric juice, is generally conceded. Disturbances of gastro-intestinal motility, tonus and secretion, conducive to the development of ulcer are attributed to neuropsychic causes. The psychosomatic conception of the disease, especially duodenal ulcer has more to support it than any other theory.

Symptomatology. Few lesions give rise to such a typical train of symptoms as does uncomplicated peptic ulcer. The symptoms fall into a number of categories, depending upon the stage, site, and complications. (1) irregular symptoms, (2) onset with gastro-enteric hemorrhage, (3) symptoms engendered by complications, simulating biliary colic, (4) predominantly vomiting, as a result of cicatricial pyloric obstruction or attributed to heightened vagal hyperirritability.

Diagnosis. It has been well said that in cases of ulcer the anemnesis is everything. Ninty-five per cent of all gross gastric and duodenal ulcers can be recognized by the roentgenologist.

Gastrosocopy. Gastrosocopy is essential for the detection of hypertrophic, erosive or ulcerative gastritis. It is also an aid to appraisal of the effect of treatment on the healing of gastric ulcer, as well as a valuable aid in differentiating between a benign and malignant gastric ulcer.

Gastric analysis. The finding of acid gastric juice is essential to the diagnosis of active chronic ulcer. The degree of gastric acidity and secretory activity is of some prognostic import. The gastric secretory status has a bearing on the surgeon's decision as to the effectiveness of a conservative operation. The diagnosis of active duodenal ulcer or primary benign gastric ulcer is not consistent in the presence of true achlorhydria. The nature of an obstructing juxtapyloric lesion without a visible filling defect usually construed as an obstructing duodenal ulcer on roentgenologic examination often can be determined or surmised by the degree of acidity, volume of gastric contents and nature of the microscopic elements. An absence of

free hydrochloric acid in such cases strongly implies the presence of an obstruction of malignant, lymphomatous, or syphilitic origin.

Distinction between chronic, benign, and malignant gastric ulcer. Small ulcerating carcinomas may present symptoms and signs indistinguishable from those of benign ulcer. About 12 per cent of lesions apparently benign on the basis of roentgenologic criteria, actually are found to be carcinomatous. Features favoring malignancy of a gastric lesion: (1) recent onset in the aged, (2) large size of lesion, (3) location on greater curvature and prepyloric area, (4) progressive clinical course, (5) histamine-fast achlorhydria, (6) early pyloric obstruction, (7) persistent occult blood in stools, (8) increase in size of lesion while undergoing therapy, (9) gastroscopic evidence of elevated edges, etc.

Diagnostic aspects of recurrent ulcer. Late surgical sequelae are often a complex problem. Anastomotic ulcers are detected roentgenologically in only about a third of cases. A malfunctioning gastro-enteric stoma should raise suspicion of the presence of such an ulcer.

Present status of therapy. Evaluation of the forms of therapy is difficult because an ulcer may heal spontaneously. Moreover the clinical course of the disease is characterized by variable periods of remission and exacerbations. The most effective therapeutic procedure is one in which the patient as a whole is encompassed in the therapeutic planning. To heal an ulcer which is amenable to treatment is not so difficult, but to keep it healed should be our firm objective. A program designed to prevent recurrences should be instituted during treatment of the active ulcer; consists largely of education of the patient as to his condition, reason for medication, rest, diet, interval feedings and good hygiene.

Vagotomy. It is too early to determine the ultimate effect of the lesion and gastric function, or to predict the future extent to which vagotomy will be utilized. So far, reports are uniformly favorable. We have not come to any conclusion as to the best indications for the operation. Vagotomy operation avoids the risk of engendering an anastomotic ulcer.

Conclusion. The highlights of the ulcer problem as they exist today have been presented. The controversial aspects of the subject are discussed and evaluated.

DEPARTMENT OF OBSTETRICS

CASE REPORT

This patient, a 24 year old para 1-0-0-1, is at this time about thirty-four weeks pregnant. Her history is non-contributory and her pregnancy to date has been entirely normal, except that early in her pregnancy, she was found to be Rh negative with antibodies. Her husband and her first child are Rh positive and she probably became sensitized during her first pregnancy. Her blood has been tested at intervals and the antibodies have remained at about the same level, the titre being moderately high. At the present time, the height of the fundus and the estimated size of the baby are consistent with the menstrual history and the fetal heart is entirely normal.

What should be the future conduct of this case?

DISCUSSION

Our knowledge of the Rh factor is still far from complete and it is difficult if not impossible, to lay down hard and fast rules for the treatment of sensitized, pregnant women. The presence of antibodies does not increase the risk to the mother unless she be given a transfusion of Rh positive blood; but the outlook for the baby is extremely gloomy. Can anything be done to improve its chances of survival? If so, what? It has been suggested that a termination of pregnancy about four weeks from term, and preferably by the abdominal route, would be of some help. This suggestion is based on the assumption that the major damage to the baby will be done in the last four weeks of pregnancy and that if this period can be eliminated, its chances of survival will be greatly improved. Unfortunately, experience has not borne out this assumption. Not only do these infants have or develop erythroblastosis, but they are further handicapped by their prematurity. The survival rate under this form of treatment has been disappointingly low. A routine which seems to offer slightly better chances of success is to allow the pregnancy to proceed to term and spontaneous labor to occur. At the time of delivery, arrangements should be complete to give the infant an immediate blood replacement transfusion should it need it. A sufficient quantity of Rh negative compatible blood is obtained, transfusion started, and then blood withdrawal from the opposite side of the body begun. Samples of the withdrawn blood are tested at frequent intervals and the replacement continued until 75 per cent of the sampled blood is Rh negative. The baby is then watched most carefully for about two weeks and should anemia *begin to be apparent*, further transfusions are given.

While no definite statements can be made as to the value of this form of treatment, it appears to hold slightly more hope for these babies than anything else in the light of the inadequate knowledge of the entire condition. There is one further advantage: if the father of the child should happen to

be heterozygous Rh positive (Rh rh), then there is a 50 per cent chance that this baby will be Rh negative and will not have been affected by the antibodies.

ACTUAL TREATMENT

The pregnancy was allowed to continue, the situation being fully explained to both parents. The mother went into labor at term and delivered easily and normally of a full term living male child. The baby was definitely anemic and the exsanguination replacement treatment outlined above was carried out. However, jaundice developed rapidly and on the third day, the infant expired. A postmortem examination showed marked cerebral hemorrhage.

ELIZABETH AITKENHEAD, R.N.

Miss Aitkenhead took over the duties of Operating Room Supervisor in the University Hospital February 1, 1922, and on that month and day this year, the University Hospital Staff of nurses, house officers and attending men celebrated her 25th anniversary with us at a cheerful and pleasant dinner in her honor.



ELIZABETH AITKENHEAD, R.N.

Miss Aitkenhead came to the University Hospital well prepared for the difficult task that confronted her. She had graduated from the City Hospital, Wooster, Ohio in 1910, and had occupied the following positions: Superintendent of the City Hospital in Wooster; postgraduate work in the Woman's Hospital in Detroit; Assistant Superintendent, Children's Hospital, Akron, Ohio; Operating Room Supervisor, and later Superintendent of Nurses, People's Hospital in Akron.

The operating rooms in the old hospital were small, poorly equipped and badly arranged, and lacking in discipline and order. A great deal of good work had been done and continued to be done in spite of these handicaps.

But soon after Miss Aitkenhead's beginning her work as Supervisor of the Operating Rooms, there was a rapid improvement in all the factors that go

to make a good operating service; discipline, promptness, good technique, quietness, order and cooperation between operating nurses, house officers and attending men. There was a gradual improvement in the manner and time required in setting up an operating room for the different kinds of operating procedures to be undertaken.

Because of her insistence, there was betterment in equipment, including lighting, the procurement of tables, instruments and other things. There was a prompt falling off in the incidence of wound infections which had not been high in spite of inadequate space for cleansing instruments and hands.

She was a strict Supervisor and had little patience with confusion, stupidity or carelessness, and was frank and outspoken in combating these weaknesses on the operating floor, but she was just and reasonable, with a stimulating interest in everything that goes to make a good service.

Probably her outstanding accomplishment was her ability to train the nurses under her, whether graduates or under-graduates, and in a short time there was created a quiet, efficient and prompt operating room nursing care.

This well run department as far as nursing, orderlies and maids were concerned, had a very strong influence on all physicians whose duty brought them on the operating floor, and had a restraining effect on the sometimes happy-go-lucky behavior of senior students assigned for various duties in this department.

On moving into the new hospital, every phase of Operating Room work received an urge to improve still further the service there. A great many surgical chores that ordinarily fall on the operating room personnel, were transferred to Surgical Supply, and I believe that since moving into the new hospital, that more carefully supervised work is done in a smaller space measured in cubic feet than in any hospital with which I am familiar.

Miss Aitkenhead's sense of duty, her knowledge of good operating room behavior, and her steadfast belief in order, preparation and discipline have occasionally brought her in brief conflict with many other hospital services such as the Training School Office, Visiting Surgeons, House Officers, students and nurses, but in the long run even these short-lived episodes have resulted in better cooperation, and better work on the part of all of us.

This is a brief note expressing our appreciation of the Miss Aitkenhead we have worked with and have learned to know, and is not to be interpreted as a gesture of farewell. On the contrary we wish her many more years of life and health, and sincerely hope these years will be spent as supervisor of nurses in the University Hospital operating rooms.

ARTHUR M. SHIPLEY

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ABSTRACT OF THE REPORT OF THE PLANNING COMMITTEE OF THE MEDICAL SCHOOL OF THE UNIVERSITY OF MARYLAND

INFORMATION BULLETIN

1. *A Tradition Breaks Down*

The Medical School of the University of Maryland has been supported largely from fees collected from its students. This source of funds is now inadequate to meet the ever-increasing cost of medical education. The tuition fees are high and the number of students which can be accepted is limited. Despite the fact that most of the clinical instruction is given by men who receive no salary or only a small remuneration for their services, the school finds that it is desperately in need of more substantial state support. This it must receive if it is to teach satisfactorily its undergraduate and graduate students. This school supplies between 50 and 60 per cent of the physicians of the state and receives only \$56,559 or 16 per cent of its support from the State.

2. *The Faculty Acts*

The department heads of the Medical Faculty, cognizant of the end of the old tradition and the desperate plight of the school, organized a Planning Committee. With cooperation of the President of the University and its alumni this committee surveyed in detail the present status of the school and hospital and projected a plan for its immediate betterment.

The plan was accepted by the President of the University.

The representatives of the Planning Committee and alumni presented the

plan to the Board of Regents. The Board accepted the requests of the committee and made these the budgetary askings of the Board of Regents from the State Legislature.

3. The plan for the Medical School and Hospital

The immediate request of the Planning Committee provides an appropriation from the State to the Medical School of approximately \$376,797. The school collects annually \$200,000 in tuition fees. When the plan becomes effective the Medical School will be approximately 66 per cent supported by the State instead of the meagre 16 per cent support under which it is now operating. The plan for the hospital will provide 40 per cent State maintenance or a total of \$748,189 instead of \$176,368 which it now receives.

The receipt of this additional support will keep the Medical School among the ranking publicly-owned Medical Schools in the United States and will provide the following essential assets to the school and hospital:

- a. Funds for research in the basic sciences and clinical departments.
- b. More adequate salary scale for the basic science departments to attract and hold men of high calibre. It will serve to bring the salary scale of this State Medical School in line with other State-supported Medical Schools.
- c. There will be provided in the clinical departments 21 additional full-time men, making a total of 33 full-time instructors on the clinical teaching faculty. This will enable all departments to develop and keep abreast of medical progress, including an opportunity for more active research in the clinical branches of medicine. Further plans are included for better development of the teaching clinics at University, Mercy and City hospitals.
- d. The Medical School will be able to develop more adequately its house officer training program and its post-graduate instruction to the physicians of the State. The latter has already been put into operation.
- e. The hospital will be able to render a more complete State-wide service for the indigent.

4. Future Projects of the Plan

The complete plan proposed by the Planning Committee of the Medical School of the University of Maryland extends over a period of eight years.

During this period the building of a New Psychiatric Unit with 125 beds, a New Nurses' Home and the erection of a West Wing to the present University Hospital is planned. This will provide for the hospital an additional 150 beds.

5. Urgency of Needs

A tradition of the past has collapsed; an era is ended. The School is at the crossroads of medical progress. To maintain its standing it must ad-

vance; to advance it must have adequate support. As the University of Maryland is a State-owned institution, its program of medical education is a public responsibility. The Faculty has brought the critical nature of its needs to its alumni and the public for their sympathetic support.

COMMENCEMENT ACTIVITIES

June 5, 1947 has been designated by the University of Maryland Medical Alumni Association as official Alumni Day on the campus of the Medical School.

Plans are now in progress to include a full day's activity which will consist of class reunions, a luncheon, annual meeting of the Alumni Association, scientific session and the traditional Alumni banquet.

Special attention is called to the scientific session which is scheduled for 2 P.M. and which will be devoted exclusively to a symposium on the Rh factor. Dr. Milton S. Sacks has been designated as Chairman of this important session and has been instructed to bring to Baltimore the most eminent authorities in this field.

Early in the Spring a detailed program will be mailed to each Alumnus. In this program will be a coupon to be used in notifying the Association of your intention to be present and as well a reservation slip for hotel accommodations. Your Association wishes to impress upon you the extreme difficulty in securing hotel reservations in Baltimore. We have organized a Hotel Reservation Bureau at the Medical School which will assist you in obtaining your hotel reservation. Printed herewith, is a form which we ask you to sign and return to the Alumni Association.

On June 5th Greene Street again becomes the focal point of medical reunions, so long discontinued by the war. Any classes desiring to hold reunions please communicate with the Medical Alumni Office, Lombard and Greene Streets, Baltimore 1, Maryland, which will be pleased to help in every possible way to make the affair a success.

Detach and return

Secretary of the Medical Alumni Association:

will

I or be present for the Commencement Activities beginning June 5, 1947.

will not

Kindly reserve a room — single — double

— Southern Hotel — Lord Baltimore Hotel

Date and time of arrival.

Name.

Address

Class.

.

NEWS ITEMS

Dr. Arthur C. Loper (P. & S.) on January 15, 1947 completed fifty years of active practice in Greenport, New York. The medical staff, associated physicians, and executive board of the Eastern Long Island Hospital honored Dr. Loper with a testimonial banquet, and presented him with a scroll in appreciation of his years of service. Dr. Loper is an active member of the Suffolk County Medical Association, the New York State Medical Association and the American Medical Association.

Dr. M. S. Eisner (P. & S. 1912) of Pittsfield, Massachusetts, is engaged in the practice of surgery and is on the staff of the House of Mercy and St. Luke's Hospital, Pittsfield, and Fairview Hospital in Great Barrington.

Dr. Charles E. Gill (U. of M. 1927) of Pittsfield, Massachusetts recently returned to his former position as district health officer with the Massachusetts Department of Public Health after four years of military service.

Dr. David B. Greengold (U. of M. 1936) of Pittsfield, Massachusetts, recently returned to general practice after four years of military service and expects to specialize in anaesthesia. He is on the staff of House of Mercy and St. Luke's Hospital in Pittsfield.

Dr. John Mace Jr. (U. of M. 1928) of Cambridge, Maryland has been appointed Chief of Staff of the Cambridge-Maryland Hospital to succeed Dr. Guy Steele.

Dr. William A. Nelson (B.M.C. 1904) of Williamstown, Massachusetts is engaged in general practice and is on the staff of the North Adams Hospital, as well as serving as a member of the local Board of Health.

Dr. Earle M. Vrooman (B.M.C. 1903) of North Adams, Massachusetts has been serving during the war years as agent of the Board of Health. Formerly he had been practicing in North Adams and has been active in National Guard affairs, having served on active duty in the Spanish-American War and in both World War I and World War II.

Dr. Salah Ahmed Abdel-Tawab, graduate in medicine from the University of Cairo, has been sent by the Egyptian Government to the Department of Pharmacology, School of Medicine, to pursue courses leading to the degree of Doctor of Philosophy. Dr. Tawab is working in the field of hypertensive drugs.

Dr. John C. Krantz, Jr., Professor of Pharmacology in the School of Medicine, was a guest of the Rockefeller Foundation at Yale University, in January, where a conference was held to consider certain problems in education in the basic sciences in medical schools.

The class of 1935 is planning to hold a reunion this June inasmuch as their tenth was missed in 1945. Letters have been sent to all members of the class and we anticipate a large attendance. Our last reunion in 1940 was most successful and we hope for even a greater representation this year.

The Committee

Harry M. Robinson, Jr., Chairman

Karl F. Mech

Ernest I. Cornbrooks

F. Edwin Knowles

PROCEEDINGS OF THE UNIVERSITY OF MARYLAND BIOLOGICAL SOCIETY

A dinner meeting of the University of Maryland Biological Society was held at the Park Plaza on January 22, 1947. Dr. R. R. Spencer of the National Cancer Institute gave a talk entitled "Recent Advances in our Knowledge of Cancer."

OBITUARIES

DR. L. D. BARNES

Dr. L. D. Barnes (P. & S. 1913) of Pittsfield, Massachusetts was killed during operations in the Pacific Area in World War II. Formerly, he had been engaged in general practice in Pittsfield and Laneboro.

DR. ALICE STONE WOOLLEY

Dr. Alice Stone Woolley died on November 16, 1946, in the Doctor's Hospital in New York of heart disease, after an illness of several months.

Dr. Woolley received her degree of Bachelor of Science from Columbia University and her medical degree from the College of Physicians and Surgeons of the University of Maryland. From 1905 to 1925 she served as director of physical education in the YWCA in Racine, Wisconsin, and in Poughkeepsie, New York. In the first World War she received the Medaille de la Reconnaissance Francaise from the French government after two years service overseas.

Dr. Woolley was a fellow of the American Medical Association, a past president of the Women's Medical Society of New York state, past president of the American Medical Women's Association, and associate editor of the Journal of the American Medical Women's Association. She was on the boards of Bowne Memorial and Samuel and Nettie Bowne hospitals, and a vice president of the former; she was medical consultant for Bard College, Annandale, a staff physician of the YWCA, and a director of the Dutchess County Health association. Dr. Wooley was also active in civic affairs and politics.

DR. WILLIAM HOWE

Dr. William Howe died of heart failure, after a short illness, on July 29, 1946, at the age of seventy three. He was a graduate of the Baltimore Medical College in 1898, and carried on a general practice in Potter County, Pennsylvania for fifteen years. From 1913 to 1934 he practiced medicine and surgery in Las Vegas, New Mexico. In 1934 he worked at the Wills Eye Hospital in Philadelphia, and from that time on confined his practice mainly to ophthalmology and otolaryngology. He was in active practice for 48 years.

Dr. Howe was a member of County, State and Southwestern Medical Societies. Besides his general practice, he served for three years as Superintendent of the Santa Fe Railway Hospital in Las Vegas, three years as County Health Officer, and for the last six years of his life as Medical Examiner for the New Mexican section of the Civil Aeronautics Administration.

- Bailey, Marshall Henry**, Norwell, Mass.; P & S, class of 1893; aged 87; died, September 18, 1946.
- Barefoot, Mordecai Lee**, Dunn, N. C.; class of 1911; aged 64; died, November 27, 1946, of diabetes mellitus and chronic nephritis.
- Burnell, Charles Willard**, Bridgton, Me.; B.M.C., class of 1896; aged 84; died, September 13, 1946.
- Crawford, George Minton**, Arcadia, Calif.; B.M.C., class of 1892; aged 84; died, November 6, 1946, of arteriosclerosis and cardiac failure.
- Hazen, Cyrus Hamilton**, Springfield, Vt.; B.M.C., class of 1901; aged 67; died, October 21, 1944, of coronary occlusion.
- Hennessy, Edward H. J.**, Stratford, Conn.; class of 1912; aged 59; served during World War I; died, November 1, 1946.
- Howe, William**, Las Vegas, N. Mex.; B.M.C., class of 1898; aged 73; died, July, 1946.
- Kahn, Howard**, Baltimore, Md.; class of 1900; aged 68; died, September 24, 1946.
- Kludjian, Assadour Hagop**, Lowell, Mass.; B.M.C., class of 1894; aged 77; died, August 5, 1946, of arteriosclerosis.
- McCollum, James Riley**, St. Mary's, W. Va.; P & S, class of 1900; aged 72; died, November 15, 1946, of coronary occlusion.
- Moulton, Allen Thomas**, Boston, Mass.; aged 56; served during World War I; died, November 22, 1946, of cardiac hypertrophy and pulmonary fibrosis.
- Patterson, Daniel Cleveland**, Bridgeport, Conn.; P & S, class of 1906; aged 63; died, September 12, 1946, of massive subarachnoid hemorrhage and coronary arteriosclerosis.
- Paulman, George P.**, Cumberland, Md.; B.M.C., class of 1906; aged 68; died, October 13, 1946.
- Perry, Herbert G.**, Louisburg, N. C.; P & S, class of 1915; aged 57; died in September, 1946, of heart disease.
- Pickel, John W.**, Kirkwood, Mo.; P & S, class of 1884; aged 91; September 13, 1946, of cardiac failure.
- Remsberg, Daniel Edward**, Roanoke, Va.; class of 1905; aged 72; died, September 14, 1946, of coronary occlusion.
- Rothblatt, Harry Lewis**, Boston, Mass.; B.M.C., class of 1908; aged 61; died, March 2, 1946, of coronary thrombosis.
- Salmon, William John Garvey**, Old Forge, Pa.; P & S, class of 1908; aged 65; died, November 18, 1946.
- Smith, J. Campbell**, Pasadena, Calif.; class of 1895; aged 86; died, September 18, 1946.
- Sprague, Fred Alvah**, Concord, N. H.; B.M.C., class of 1906; served during World War I; died, December 8, 1946, of cerebral hemorrhage.

Stambaugh, Elmer S., York, Pa.; P & S, class of 1910; aged 68; died, July 18, 1946.

Teeter, Edmund Hershey, Jacksonville, Fla.; class of 1910; aged 64; died, November 3, 1946, of carcinoma of the stomach.

Whitted, Walter Puryear, Gallup, N. Mex.; class of 1919; served during World War I; aged 53; found dead on September 21, 1946.

Wilson, Frank W., Col. M.C., U.S.A., Swannanoa, N.C.; class of 1914; aged 58; served during World Wars I and II; died, April 20, 1946 of coronary thrombosis.

Woolley, Alice Stone, Poughkeepsie, N. Y.; class of 1930; aged 64; died, November 16, 1946, of coronary thrombosis and broncho-pneumonia.

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